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REPORT OF THE FEDERAL PLAN COMMISSION ON A GENERAL PLAN FOR THE CITIES OF OTTAWA AND HULL

1915

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ON A

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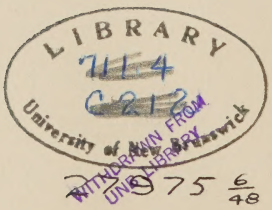
OTTAWA AND HULL

COMMISSIONERS

SIR HERBERT S. HOLT, Chairman.
SIR ALEXANDRE LACOSTE, P.C.
R. HOME SMITH.
FRANK DARLING, R.C.A., F.R.I.B.A.
THE MAYOR OF OTTAWA.
THE MAYOR OF HULL.

1915

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DRAWING No. 1

General birdseye view, looking northward, showing the location of the cities on the Ottawa, Rideau and Gatineau Rivers, highways, parks, forest reserves and future expansion of the city.

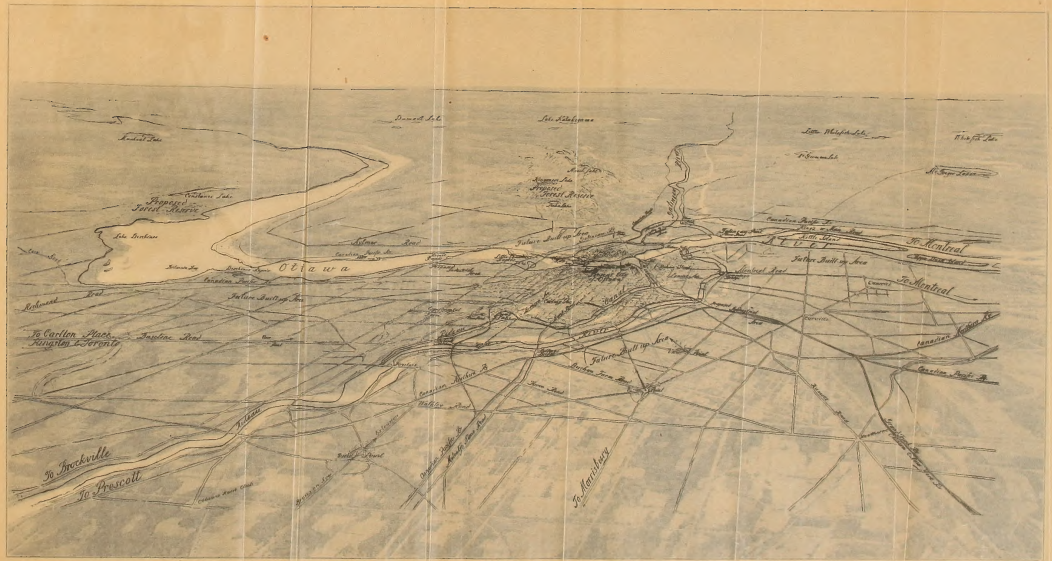
Key to general birdseye view.

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Key to the following Drawing No. 1

Key to general birdseye view.

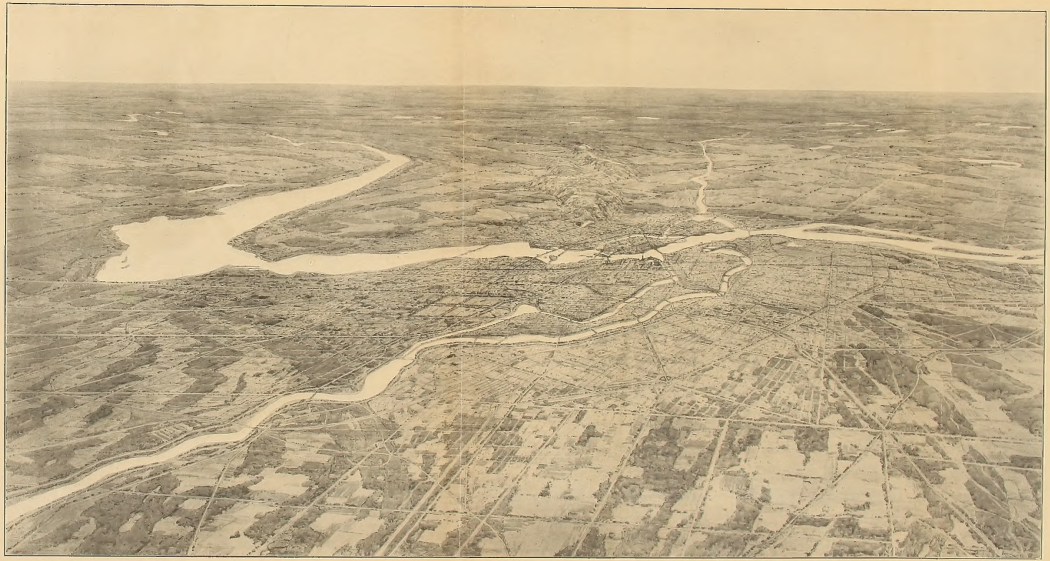


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General birdseye view, looking northward, showing the location of the cities on the Ottawa, Rideau and Gatineau Rivers, highways, parks, forest reserves and future expansion of the city.

Key to general birdseye view.



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E. H. BENNETT, CONSULTANT ON CITY PLAN
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JANUARY, 1915.


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NOTE.—The original plans have been delivered to the Government.

ORDER-IN-COUNCIL

(*P.C. 2304*). *Certified copy of a Report of the Committee of the Privy Council approved by His Excellency, the Administrator on the 12th September, 1913.*

On a Memorandum dated 8th September, 1913, from the Minister of Finance, submitting that in an Order-in-Council dated the 5th June, 1913, it was provided that a Commission should be constituted consisting of at least six members, inclusive of the Mayor of the City of Ottawa, and the Mayor of the City of Hull, charged with the duty of taking all necessary steps to draw up and perfect a comprehensive scheme or plan looking to the future growth and development of the City of Ottawa and the City of Hull, and their environs, and particularly providing for the location, laying out and beautification of parks and connecting boulevards, the location and architectural character of public buildings and adequate and convenient arrangements for traffic and transportation within the area in question.

In this Order-in-Council it was further provided that the Government should pay half the cost of the said plan and that the other half should be paid by the two cities jointly and ratably according to population.

The Minister has been officially informed that the municipal authorities have expressed their desire to co-operate with the Government in carrying out the proposal and in bearing their share of the expense as mentioned.

The Minister, in view of the foregoing, recommends that an honorary Commission be appointed for the purpose hereinbefore set forth, consisting of the following members, namely:—

His Worship, the Mayor of Ottawa, Ex-officio.
His Worship, the Mayor of Hull, Ex-officio.
Sir Alexandre Lacoste, K.C., of the City of Montreal.
Herbert S. Holt, Esq., of the City of Montreal.
Frank Darling, Esq., of the City of Toronto.
R. Home Smith, Esq., of the City of Toronto.

The Minister further recommends that Mr. Herbert S. Holt be appointed Chairman of the said Commission.

The Minister also recommends that the said Commission be authorized and empowered to employ clerical and other assistants, to engage city planners, landscape gardeners, architects, engineers and other experts, to summon before them witnesses and generally to take such steps as may be necessary to accomplish the objects of the Commission.

The Minister still further recommends that provision be made in the yearly estimates of the Dominion to meet the proportion of expense to be borne by the Government.

The Committee submit the same for approval.

(Signed) RODOLPHE BODREAU,
Clerk of the Privy Council.

To the Hon. W. T. White,
Minister of Finance,
Ottawa.

Sir:—

In accordance with instructions as set forth in Report of the Committee of the Privy Council, approved by His Excellency the Administrator, on the 12th day of September, Nineteen Hundred and Thirteen, on behalf of the Federal Plan Commission, we have the honor to submit herewith our report on a General Plan for the Cities of Ottawa and Hull.

We selected for the study of the problem Mr. E. H. Bennett, as Consultant on City Plan, and Mr. E. L. Cousins, as Consulting Engineer, and take this occasion to express our appreciation of their services.

We desire to make acknowledgment of the assistance rendered by the Officials of the Government, the Cities of Ottawa and Hull, the railways and other public service corporations and the members of the Ottawa Improvement Commission, and to thank them sincerely for their hearty co-operation during the course of the work.

We desire to acknowledge the services of the following in the preparation of the plans and the report:—

Mr. Paul H. Lazenby, Engineer of Mr. Bennett's staff, who, in co-operation with Mr. Cousins, treated all matters pertaining to steam railway, water and street railway transportation, together with the collection of statistics at Ottawa and other economic features of the problem; Mr. William E. Parsons, Architect of Mr. Bennett's staff; Mr. A. E. K. Bunnell, Engineer-in-charge of the Ottawa office, under whose immediate direction all surveys were carried out and data gathered, assisted by Mr. H. W. Tate and Mr. H. S. Bedell, Surveys Engineer and Chief Draftsman, respectively; Mr. H. T. Frost and Mr. F. C. Walker, of Mr. Bennett's staff, for work done respectively on the General Plan and on the Government centre; Mr. Jules Guérin for the rendition of the perspectives. Also we desire to thank Mr. A. Stuart, Superintendent of the Ottawa Improvement Commission, for valued assistance rendered.

The object of the Commission has been to prepare a comprehensive plan looking to the future growth and development of the Cities of Ottawa and Hull and their environs and particularly applied to the location and architectural character of future Government, public, administrative and private buildings; to adequate and convenient arrangements for vehicular and pedestrian travel via arterial highways; to steam railway, electric railway and water borne transportation problems; and to parks and connecting boulevards.

The various recommendations are dealt with in detail in the report, but we wish to bring briefly to your special attention the following outstanding features that have strongly impressed themselves upon us in our study of the problem.

(I.) We are of the firm opinion that the future improvements in the area about the Capital at Ottawa and Hull should not be attempted without first establishing a Federal district and securing for the Federal authority some control of local government.

(II). We are of the firm opinion that the pivot, on which hinges the success or failure in carrying out any comprehensive plan, lies in the proper solution of the problem of steam railway transportation.

(III.) In order that proper administrative and office accommodation may be provided for the work of the Government, the extension and development of the Government Buildings should be carried out on a comprehensive plan.

(IV.) There should be proper control of residential and manufacturing districts by enforcing building restrictions.

(V.) The highly commendable work of the Ottawa Improvement Commission should be extended and enlarged by the development of a broad and forceful policy as to further park lands, and there should be established a National Park or Forest Reserve in the Laurentian Hills, under control of the Dominion Government.

The plan and report should not be taken as final in detail, but be considered as a general study of the conditions affecting the probable future growth of a National Government Centre.

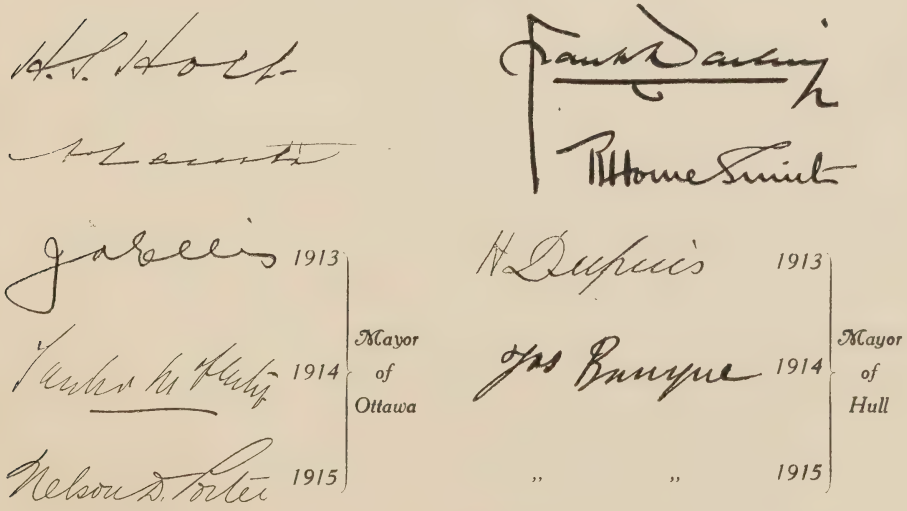
The plan is one in which the various elements have been weighed in their relation to one another and after careful study have been recorded, and it is our belief that it will serve as a real guide in the future growth and development of the Cities of Ottawa and Hull.

The plan has not been prepared on the assumption that the Cities of Ottawa and Hull would be remodelled at once, but with the idea of a gradual adoption of a definite objective to be reached as necessity arises and finance permits.

Both private and public works and improvements of the future should be co-ordinated and carried out along lines which will conform with the general plan and at the same time emphasize the many graceful physical characteristics with which Ottawa and Hull are now blessed. Thus ultimately we should have a beautiful Federal District, of which not only the citizens of Ottawa and Hull and the surrounding country will be proud, but a Capital in which everyone in the Dominion of Canada can take satisfaction.

We have the honor to remain, Sir,

Your obedient servants,



PART I.

OUTLINE OF THE PROPOSALS OF THE COMMISSION

OUTLINE OF THE PROPOSALS OF THE COMMISSION

In 1858 Ottawa was chosen as the capital of Canada. The Canada of that day was not a great federal state, but a union under one legislature of the two provinces, now known as Quebec and Ontario. Each province had once possessed a legislature of its own, but in 1841, as a result of the acute political disorder which had led to rebellion and bloodshed, the separate legislatures were abolished and the whole of the Canada of that time was placed under a single parliament. There was rivalry between the two former divisions. Neither was willing that the other should have the capital within its borders, and accordingly, for many years, the government was migratory. At first Kingston was the capital. Then, for a time, Montreal had the honour. Later the capital alternated between Quebec and Toronto. Such a system could not endure. A government must have a permanent home. The Canadians themselves could not, however, agree upon the situation, for neither division would yield the honour to the other. In the end the choice was left to Her Majesty, Queen Victoria, and it fell upon Ottawa. While this town lay within what is now Ontario, it was only across the Ottawa River from the Province of Quebec, and was much nearer Montreal, the commercial centre of Quebec, than to Toronto, the commercial centre of Ontario. One leading consideration which determined the site was that Ottawa lay remote from the American frontier, and was thus likely to be secure from attack in time of war.

Within about a dozen years after Ottawa had been chosen as the capital, Canada had passed through another profound political change. By 1871 the two provinces had expanded into a great federal state, stretching from the Atlantic to the Pacific. The organization of Ottawa, however, was not in any way altered to meet this increased dignity in its position. It remained a city in the Province of Ontario, governed, like any other city of that province, under authority derived from the provincial legislature at Toronto. No one seemed to think that there was anything anomalous in leaving the capital of the whole federation under the municipal law of one of its provinces. The statesmen of the time believed that a single group of buildings would long suffice for the needs of Canada, as, to this day, a single building suffices for the needs of the provincial government at Quebec, or Toronto, or any other

provincial capital. The federal system had ripened naturally out of earlier conditions, and few realized then that the eyes of the people of half a continent would turn to its political centre and that a vast system of governmental administration would in time make it necessary that Ottawa, like Washington and Rio de Janeiro, should become a great capital, dominated by the government of which it was the seat.

In some respects Ottawa was happily chosen for its rôle. It lies on the banks of a great and beautiful river, the Ottawa, and has direct communication by water with the mighty St. Lawrence, which discharges the waters of the Great Lakes. Two subsidiary rivers flow into the Ottawa near the site of the capital, the Gatineau, which comes through a picturesque valley from the north, and the Rideau, which reaches the Ottawa from the south. Two striking waterfalls, the Chaudiere and the Rideau, lie within the borders of Ottawa. A canal of the dimensions of a river passes through the heart of the city, and is available not merely for commerce but for recreation. Parliament Hill is a high bluff rising one hundred and fifty feet from the Ottawa River. Looking northward across this river, the observer has in view the Laurentian mountains stretching away into the distance and still covered, in part, by the primeval forest. London, Paris, and Washington are all great capitals, each of them situated on the banks of a river, but none of them has the natural beauty of Ottawa. Nature, indeed, offers a direct invitation to make this northern capital one of the most beautiful in the world.

It was inevitable, that at the outset, Ottawa should offer little prospect of realizing such an ambition. By an accident of politics, a small town in the backwoods was suddenly turned into a capital. Its present was sordid and its future was uncertain. Probably not half a dozen of the legislators who sat in the Canadian Parliament would have chosen Ottawa as the capital could he have had his own way. It represented a compromise for which no one was enthusiastic. The place had to pass through the ugly stages of growth which are found in the history of every city in the New World. It had been laid out, not as a capital, but as a manufacturing town, chiefly concerned with reducing the timber of the adjacent forests into the varied forms required by commerce. It needed railways and was prepared to give the railway companies whatever advantages and conveniences they demanded, if they would only come and help to develop the commerce of the city. It used the Chaudiere and the Rideau Falls solely for industrial purposes, with no thought of preserving their natural beauty. Little trouble was taken to keep sightly the banks of river and canal; to make them useful for trade and industry was the one thought. The city had been laid out on no plan,

and it developed on no plan. Industries grew up where they would. The railways carried on activities mostly as they liked. They had level crossings on the streets, they occupied more land near the centre of the city than was necessary for their purposes, and Ottawa was only too glad to have them busy. Hull, on the opposite side of the river, in the foreground of the beautiful view northward from Parliament Hill, grew up as a purely industrial city without a single park area. No one was to blame, for the business of Ottawa was to take root as a city and to make its own commercial destiny possible.

It was certain, however, that, in time, the part of Ottawa in the political life of Canada as a whole should be emphasized. Its dignity was, in truth, the concern of the whole country. Since the capital is the seat of the government of the nation, the nation has for it a large measure of responsibility. The patriot likes to think that foreign visitors will be impressed by the appearance of the capital city. A degree of beauty and majesty goes with the idea of a capital, and time would inevitably bring the transformation of the village on the Ottawa in harmony with this necessity.

The United States offers to Canada an object lesson in the growth of a capital. Soon after the United States was formed, it was decided to fix the capital on the banks of the Potomac River, in the border land between the North and the South. Since the capital belonged to all the states it was deemed fitting that it should not be situated in any one of them. Accordingly, a considerable territory, now containing sixty-nine square miles, was set apart as the District of Columbia. Washington was planned on a magnificent scale, which should suffice for its growth for all time. There were to be broad streets and beautiful squares. Extensive areas of land stretching the long distance from the White House to the Capitol were set apart for the use of the government. Political strife was as far as possible banished from the District of Columbia for its residents were not citizens of any state, and had no vote in national affairs.

The growth of Washington into the likeness of a great capital was, however, slow. In 1800, when the national government was established in Washington, the new capital was more completely a backwoods settlement than was Ottawa, sixty years later. A city magnificent on paper was, in reality, apart from its few public buildings, a wilderness of muddy streets, some of them without houses. The Capitol itself stood in the midst of a marsh. As late as in 1846 it was seriously proposed to abandon Washington. When the civil war broke out in 1861, Washington had only about sixty thousand inhabitants, may of them negroes. For a long time it had a government elected by the citizens. Its rulers were, however, more concerned with

local questions than with the needs and dignity of the national capital, and it could thus happen that Washington long remained a dreary waste of what were called in derision "magnificent distances." Visitors were struck with the poor appearance of the city and its inadequacy as the centre of the political life of a great nation.

In 1871 came re-organization. The municipal government was abolished and Washington was placed under the direct control of federal commissioners. Magical changes followed quickly. To develop a great capital had been beyond the resources of a municipality. Now, under federal control, Washington realized its original, adequate and systematic plan. To-day it has become one of the finest capitals in the world, and there is little doubt that another fifty years will make it the very first of capital cities, in noble buildings, wide streets and avenues, and pleasant, leafy squares. Half of the total area of the city is devoted to its broad streets, avenues, and parks. The avenues are from 120 to 160 feet wide, the streets from 80 to 120 feet. Many of the thoroughfares have two and some of them have four avenues of shade trees. For the distance of nearly two miles from the White House to the Capitol stretches a park-like area and along this great open space are arranged great government buildings. Washington has also a great tract of forest land which remains in a wild state.

The history of Ottawa is both like and unlike that of Washington. It is like in that a municipal system has not been and could not be adequate to serve both the narrower local and the wider national needs. In addition to this, however, Ottawa has laboured under disadvantages from which Washington has been free. From the first, Washington was planned with bold confidence on a scale suited to the capital of a great federal state. In the future of Ottawa, on the other hand, there was, from the first, no great belief. When Ottawa was fixed upon as the capital and it was decided to erect two large buildings for the business of the government, Mr. George Brown thought this a stupendous folly, and declared that the buildings would suffice for the needs of the capital during two hundred years. There could be no federal district for the Capital, since there was then no federal government. But, within ten years after Mr. Brown's declaration, Canada had become a great federal state, the equal in area of the United States. Yet the capital remained unaltered in its status, a city in the Province of Ontario, governed exactly as any other city in the Province is governed.

Within a few years after the formation of the Dominion of Canada it was found that the government required a great increase of accommodation. A third building, known as the Mackenzie Block, was added to the notable group on Parliament Hill. But soon this was not enough. Since there was

no plan for the development of the capital, buildings were put up whenever and wherever necessity seemed to require, some of them as cheaply as possible, with little thought of architectural effect or of convenience for the work of government as a whole. As a result, the appearance of Ottawa was not worthy of the capital of an important state. From time to time efforts were made to correct defects. A few years ago a Commission was named for the improvement of Ottawa, and the federal government made an annual grant to aid in this purpose. The Commission has done excellent work. Ottawa has been much improved. But the time came when this method was found inadequate. In 1913 the Commissioners who have the honour to offer the present Report were appointed to consider and make recommendations in regard to the whole question.

To make the Report sufficiently definite to be serviceable, it was found necessary to prepare a large number of drawings and diagrams and also to describe in detail the nature of the changes proposed. At the outset, the Commissioners were confronted by the problem of the control of the capital, and they formed the opinion that an indispensable requisite to the success of their plans would be the creation of a Federal District with federal control of the area composed of Ottawa, Hull and the surrounding suburbs. It is not certain that it would be necessary or wise to adopt for Ottawa in all respects the same kind of federal control that is applied to Washington. But it is certain that federal control alone will ensure the carrying out of really adequate plans. It is also certain that the dignity and beauty of the capital of Canada are not more the business of the people of Ottawa than of the people of Canada as a whole. It could not be expected that a municipality would be able to perform such a task on an adequate scale. It would require more money than they could afford, and a steady continuous policy which does not exist under municipal government. For the future of the national capital control of the left bank of the Ottawa River and the city of Hull is vital. The two cities look at each other across a beautiful stretch of flowing water. Nature has made them part of one whole, and they can come under one control only by union in a federal district.

The two chief factors in making a city attractive are, first, the convenience of its arrangements in respect to the business, comfort and enjoyment of its inhabitants, and, secondly, its general aspect in regard to dignity and beauty. The tendency of cities, as noted in the Report, is to take a circular form. At the heart of the circle is the intensive business, and in this point the means of communication centre. The less intensive business of warehouses and industry will be on the rim of this inner circle and the residential districts will tend to form the outer section of the city as a whole.

It is regarded as vital in the effective arrangement of a city that its industries should be concentrated in industrial areas and not scattered over the city indiscriminately. It is proposed that there shall be one industrial area in the eastern quarter of Ottawa, one at the Chaudiere Falls, and two similar areas in Hull. It is, of course, of vital importance to Ottawa that its industries should be helped and not hindered by the proposed improvements. In order that workers may pass readily to and from the scene of their occupations, convenient and rapid transit is of first moment. It tends to prevent the crowding of the population in too narrow an area, and also to check the extravagant prices of land which such crowding would involve. The problems of the cities of Ottawa and Hull, in respect to these aspects of their life, are discussed fully in the Report and plans for their future growth are outlined.

Railways constitute a difficult problem in a city. Every large city has rival lines and large areas are necessary for their traffic in respect both to passengers and to goods. Ottawa presents peculiar difficulties to railways. It is situated on the high bank of the Ottawa River; it is bisected by a canal; and it has a lesser river flowing through the city to join the Ottawa. The railways, through lack of any unity of plan, have almost necessarily accentuated the natural difficulties and have created strong barriers between the divisions of Ottawa. The problem has caused to the Commissioners much anxious thought. A complete re-arrangement is necessary, a costly arrangement, indeed, but one which will, in the end, effect such economies in operation as to be profitable. The plan which the Commissioners recommend involves a control by a single authority of the railway trackage and terminals. With slight alteration, the Grand Trunk station will become a central passenger station for all the railways, and this will involve the concentration at this point of the greater part of the passenger traffic. To carry this out a tunnel to connect the east and the west will be necessary for passenger traffic. The freight traffic can be handled from two centres, one in the east and one in the west, and the Commissioners have been at pains to make specific recommendations on these points. When their plans are carried out, there will be but one level railway crossing in Ottawa, and this will be, not on a principal line, but on a siding at the waterfront.

It is not too much to say that the general aspect of Ottawa will be imposing when the proposed improvements are made. The central area in the city will be a great open space running southward from the present Chateau Laurier and the Plaza bridge, and at the same level. Canal, railway, and cartage traffic will be on a lower level. The mode in which this can be carried out is explained in the Report and a sketch of the suggested appear-

ance of the new Plaza will be found on Drawing No. 5. On the east side of this open space will be the Grand Trunk Station, transformed into a Union Station, with entrances from both the Plaza and Rideau Street. The traveller who arrives in Ottawa will step out upon an attractive scene as he emerges on the Plaza from the station. The view northward will be free, for the present Post Office will have been removed. At his right he will see the Chateau Laurier and the East Block of the Parliament Buildings, with trees in the open spaces and the river and the distant Laurentian mountains in the farther background. Before him will be the great Plaza with notable buildings on its west side. It is hoped that here will be the municipal centre, with a new City Hall, the necessary Law Courts, Registry Offices, &c. The Plaza will extend southward to a new diagonal street driven through from Laurier Avenue to Rideau Street.

The traffic between the East and the West of Ottawa now passes across the narrow connection at the Plaza Bridge, but all this will be changed. The great thoroughfare between the East and the West will be Laurier Avenue, which will be widened to ninety feet. Sparks Street, already too narrow for its crowded traffic, will be relieved, and Wellington Street will discharge its proper function of a quieter street passing by the Parliament Buildings. The improvement of Laurier Avenue into this great thoroughfare should be undertaken at once, independently of other questions. A tunnel through the cliff at the west end will be necessary, and also a lowering of the bridge across the Rideau at the east end. When this is effected the street will have an easy grade, and will be a finer business thoroughfare than Ottawa now possesses.

While the Plaza will be the central point of the activities of Ottawa as a municipality, Parliament Hill will retain its primacy as the Government centre. The land west of the Parliament Buildings, stretching to the neighbourhood of Bronson Avenue, and the land on top of the cliff, will be used for the departments of Government. Here, in time, a second group of buildings to harmonize with those on Parliament Hill will spring up as suggested on Drawings Nos. 14 and 15. These groups of buildings north of Wellington Street will be the scene of the chief governmental activities. Bordering on the east of Major Hill Park, stretching along Sussex Street, from Rideau Street to the Mint, there will be other buildings less ornamental in character and built for practical utility. The various workshops of the Government will be placed behind these on the east side.

The Government Buildings will constitute the most striking architectural feature in the capital. The Federal District of which they will be the centre

will include the whole of the present cities of Ottawa and Hull, and also their suburbs within a radius of at least four or five miles from Parliament Hill. The Commissioners have planned to devote only a moderate amount of ground space to government buildings, over and above that actually occupied by the buildings themselves. For this purpose Washington has about three hundred acres. The present plan contemplates that Ottawa should have about one hundred and twenty acres and it is thought that, owing to the advantageous position of the buildings on the high banks of a river, this land will prove adequate for the future.

The residence at Ottawa of the representative of His Majesty the King, should be dignified and have dignified approaches. It cannot be said that this is entirely true of Government House as it now stands. The plans here presented contemplate that, in time, there shall be created a beautiful drive extending along the banks of the Ottawa River from Major Hill Park to the entrance to Rideau Hall. This broad way, which is shown on Drawing No. 9, will be park-like in character. The entrance to the grounds of Government House adjoins the entrance to the beautiful Rockcliffe Park, and there is an unique opportunity for a spacious circle and beautiful approach to both. On one side of the drive will be the waters of the river, and there will be striking views both of Parliament Hill and of the Laurentian Mounains across the river to the north. A portion of the drive is now constructed, and this work should be continued apart altogether from the question of creating a federal district. When completed, it will link Government House and the Parliament Buildings in a very picturesque and delightful manner.

There remains a last consideration of great importance. One of the attractions of Ottawa is to be found in the slopes on the north side of the river which stretch away to a sky line of distant forest-clad mountains. Nature, which has not made this tract of land fertile, has made it beautiful. Much of it is still covered with forest. Since it has little commercial value, it could be acquired at slight cost and a great tract of it, consisting of 75,000 or 100,000 acres, should be secured as a national park. Here, at the very door of the capital, should be preserved, for all time, a great area in the state of nature. It would include lakes and hills. The owners of land who now occupy it, simple farmer or hunter folk for the most part, need be little disturbed, and could be employed as game and timber wardens. Such a park would have scientific value, both in respect to forestry and to wild life. Its growth of timber might even be made profitable. The Gatineau River, a part of which would be included in the park, flows through one of the best regions for wild game in North America and, under proper restrictions, the park would offer excellent sport for rod and gun. But, above all, it would have

priceless value for those who live in or visit Ottawa. Within half an hour they could pass from the bustle of the capital to the seclusion of the forest. Side by side would be seen the beauty of the city, which man has created, and that of nature as it has been for countless ages. It is not proposed that this park should be included in the federal district to be formed, and the carrying out of this proposal need not wait upon other plans for the capital.

In planning for the future of Ottawa, the Commissioners have made what they regard as the modest estimate that by 1950 the city will have 250,000 inhabitants, about two and a half times its present number. Since it is necessary now to plan park areas within the city for all time, they have provided parks for a city of 350,000 people. Hull is now entirely without any park, and this is to be remedied. The waterfront of Hull has been largely used for piling lumber. This is a transient condition, and the land should be secured as occasion arises and should be planted with trees. The interests of commerce should not, of course, be neglected, but this can be done while at the same time making sure that the view of Hull from Ottawa shall be agreeable. The parks within the two cities will include some 3,000 acres of land. A playing field, of from eight to ten acres in extent, is provided within half a mile of the dwelling of every inhabitant of the city. As far as possible hill tops with good views are reserved for small parks. Southwest of Ottawa, some miles beyond the city limits, is a tract of wooded land with fine views which would make a beautiful suburban recreation ground. Some eight hundred or a thousand acres should be secured now, and left to its present uses as long as this should be necessary. The hills and extensive waterways about Ottawa offer the opportunity for many beautiful drives. The plan includes connections between the parks by park-ways and drives. In all, there are forty-six square miles of park-ways and waterfront. The numerous watercourses should be extensively used, not merely for business, but also for recreation. Few cities offer better facilities than Ottawa offers for pleasure upon the water.

Roughly speaking, the proposed district should extend from Chats Falls at the head of Lake Deschenes on the west, to Green's Creek on the east, and from a point ten miles south of Ottawa to a point about ten miles north.

Such, in brief outline, are the proposals to make Ottawa and Hull the city beautiful. To realize the ideal of the Report will involve working upon a plan for many years. The cost to be incurred from year tc year will not, however, be excessive, and each year's outlay will result in the drawing ever nearer of a dignity and beauty in Ottawa which will fit it to rank among the notable capitals of the world. The control of the city by a body of expert

federal Commissioners will involve economy in administration and unity between the commercial and the æsthetic points of view. It may be that Ottawa is destined to become, like London, Paris, Berlin, Rio de Janeiro and other capitals, a great business centre, and it should be governed with this hope and possibility in view. While this prospect is not yet assured, it is certain that Ottawa is to remain the capital of a great state. To be this adequately, there must be harmony and beauty in its architecture and spaciousness and dignity in its surroundings. It is the opinion of the Commissioners that the transformation of Ottawa can be effected without laying any heavy burden upon its citizens or the nation.

PART II.

THE PRESENT CITIES

THEIR DEVELOPMENT AND STREET SYSTEMS

GENERAL PLAN

MAJOR AND MINOR RECOMMENDATIONS

THE PRESENT CITIES AND GENERAL PLAN

General Considerations

The growth of Ottawa and Hull in the next forty or fifty years will require the construction of cities twice as large as those now existing. This will mean rebuilding in a more productive manner on much of the land now occupied, and the extension of all residential and business areas and of all public utilities.

The plan is framed to take advantage of this natural growth, in which lies a splendid opportunity for control and arrangement of the future cities. It is essential, therefore, that the chance should be seized now to control and regulate this growth, as otherwise there is no question but that conditions in the future will be no better than they are to-day.

A city plan has to do primarily with the proportions and inter-relations of the areas devoted to commercial, residential and recreational activities. In Ottawa, these areas are already strongly, though, in our judgment, somewhat improperly, defined.

The respective functions of each district of a city, the inter-relation of each district with the others and with the outlying areas, and the general nature and direction of growth of the whole are bound up with and in the main determined by the routes of locomotion—the railways, the waterways and the streets. These, in their turn, are governed by topography.

The structure of a city will be found, generally speaking, to have a tendency to take a circular form. The centre is devoted to intense business; adjacent to the centre is concentrated a zone of tenement, warehouse and industrial development, the last named stretching out along the lines of transport. Outside of this, and spreading out indefinitely are the residential areas. Radial arteries from these outlying areas pierce the inner rings of mixed occupancy and reach the central section. Outlying business centres grow up along these arteries, their size and importance depending on their distance from and on the facilities for movement into the main centre, and also on the extent and quality of the surrounding residential areas.

The Present Cities, their Physical Conditions and Street Systems

The successful re-planning of the Cities of Ottawa and Hull cannot, in our judgment, be carried out, without an almost complete re-arrangement of the railways, in general similar to the one suggested in the section on "Railways and their Terminals."

Closely bound up with the railways and in some measure depending on their re-arrangement, is the question of bridges across the Rideau Canal and the Rideau River in Ottawa and Brewery Creek in Hull.

The condition of the cities in their relation to these things is outlined on the diagram and drawings. The effect of the railways and waterways, in cutting up the city, is shown on diagram, page 33, and the lack of street crossings over them on Drawing No. 10.

Drawing No. 19, Diagram "A," shows the character of the development taking place throughout the cities. It shows the residential districts of different character, and the way in which those of poorer quality gather round railway, industrial and storage districts. It shows also the area flooded by the Rideau River, and the unfortunate results arising therefrom. The areas, where industries may be expected to develop unless steps are taken to control and segregate them, are also outlined.

Diagram, page 35, has been prepared for the purpose of assisting in the discussion of the present conditions in the cities, and of showing the structure of the street system as proposed in the plan. For convenience of description, the cities are treated in five sections, which are separated by the main vehicular arteries of travel or by natural barriers.

Attention is directed to these diagrams and drawings.

Physical Conditions and Relation of Cities to Railways and Waterways

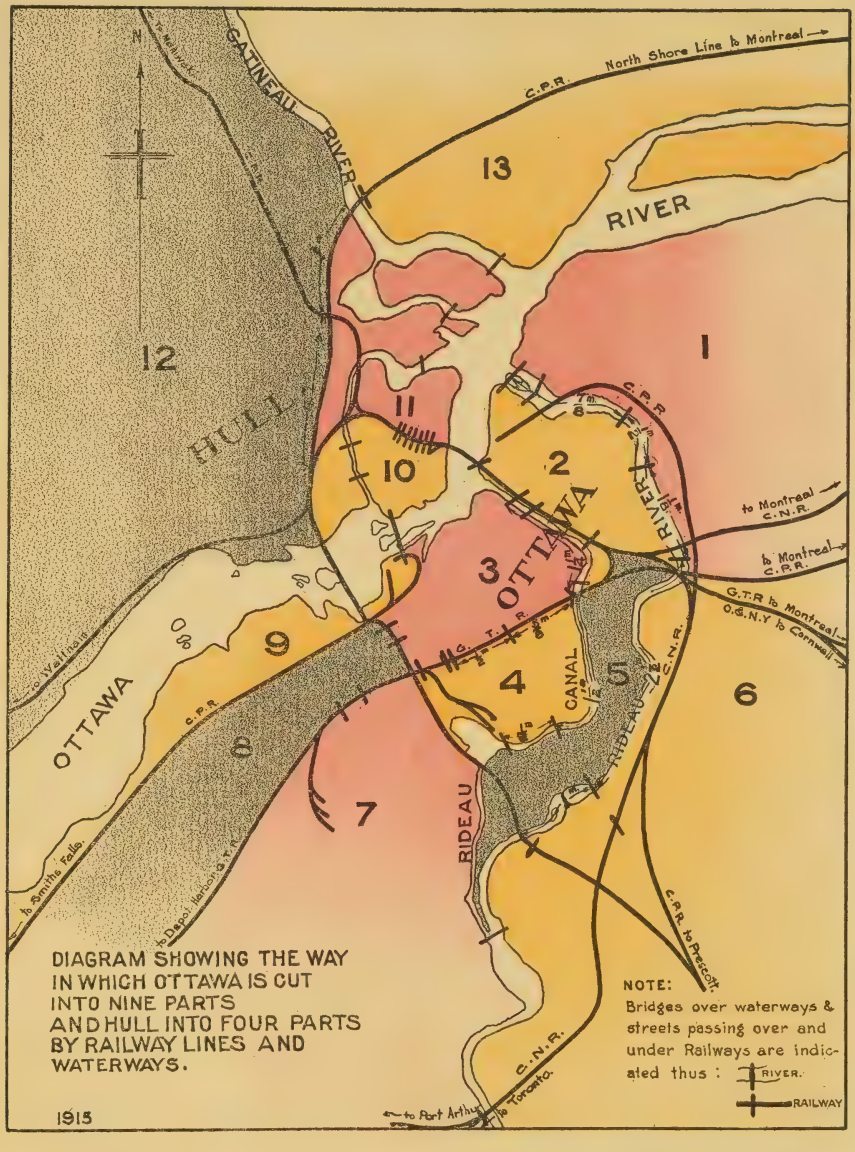
The railways and waterways have cut Ottawa into practically nine sections, and Hull into four, as shown on Diagram, page 33, and are responsible for much of the lack of order and proper street facilities described below.

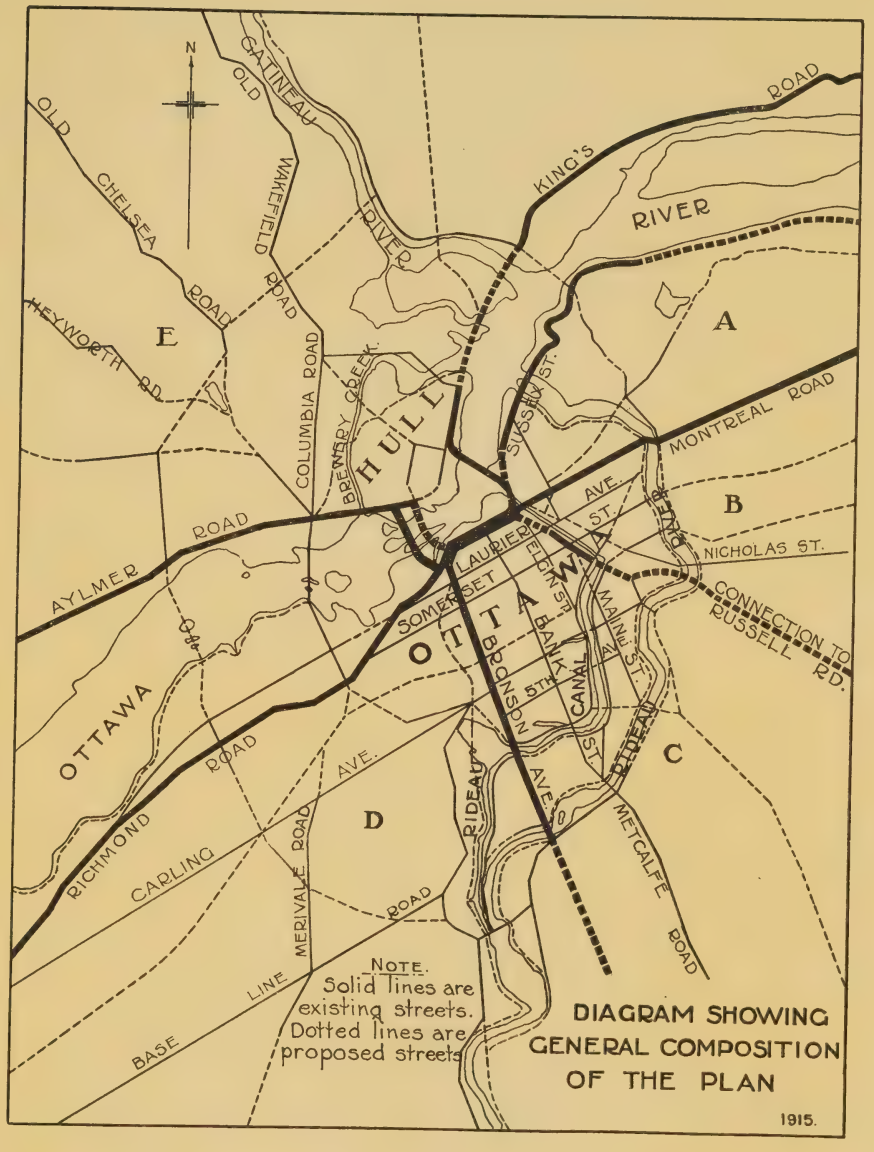
Ottawa

The Rideau Canal, together with paralleling railways, cuts Ottawa into two main parts; an eastern one and a central and western one. The Plaza Bridge and Laurier Avenue Bridge are the only direct ways of communication between them. This barrier extends as far as Gladstone Avenue, and, from that point to Hurdman's Bridge, the railways and industries practically blocking all passage between the eastern and central sections of the city.

On the east side of Ottawa, the Rideau River, with its lack of bridges, and the Sussex Street branch of the Canadian Pacific, with its lack of separated crossings, have cut the eastern section into two smaller parts, and have successfully made inaccessible the areas farther to the east. The industries beginning to appear in this neighbourhood, will widen this barrier as they increase in number. They do not now add to the attractiveness of the district, and their growth will result in a more general deterioration of property. The flooding from the river is also a great menace.

The building up of the district along the east side of the Rideau River, is going forward slowly. There is but one car line, and this should be extended


N
GATINEAU RIVER
C.P.R. North Shore Line to Montreal
13
RIVER
1
12
HULL
11
10
2
C.P.R.
RIVER
to Montreal C.N.R.
to Montreal C.P.R.
3
OTTAWA
G.T.R to Montreal
O.C.N.Y to Cornwall
9
OTTAWA
C.P.R.
4
CANAL
5
C.N.R.
6
8
7
RIDEAU
RIDEAU
C.P.R. to Prescott
to Smiths Falls
to Depot Harbour G.T.R.
to Port Arthur
to Toronto
C.N.R.
DIAGRAM SHOWING THE WAY IN WHICH OTTAWA IS CUT INTO NINE PARTS AND HULL INTO FOUR PARTS BY RAILWAY LINES AND WATERWAYS.
1915
NOTE:
Bridges over waterways & streets passing over and under Railways are indicated thus :
RIVER.
RAILWAY


N
GATINEAU
OLD
OLD CHELSEA ROAD
WAKEFIELD ROAD
RIVER
KING'S ROAD
RIVER
HEYWORTH RD.
E
A
COLUMBIA ROAD
BREWERY CREEK
HULL
SUSSEX ST.
MONTREAL ROAD
B
AVE.
ST.
LAURIER
ELGIN ST.
NICHOLAS ST.
AYLMER ROAD
SOMERSET
BANK ST.
MAIN ST.
CONNECTION TO RUSSELL RD.
OTTAWA
BRONSON AVE.
CANAL
RIDEAU ST.
OTTAWA ROAD
AVE.
RIDEAU
C
RICHMOND
CARLING
MERIVALE ROAD
D
METCALFE ROAD
ROAD
BASE LINE
NOTE.
Solid lines are existing streets.
Dotted lines are proposed streets.
DIAGRAM SHOWING GENERAL COMPOSITION OF THE PLAN
1915.

to serve a greater area. A line running out along the Montreal Road would rapidly complete the filling up of the Eastview area, and lend a great impetus towards its improvement and development.

The cross-town line and yards of the Grand Trunk Railway, together with the industrial buildings which have grown up about it, and also the large lumber areas which this has attracted along its length, have cut the central section into two more parts, the southern one being itself again broken up by the Rideau Canal and the Rideau River.

This railway barrier, between the Canal and Bronson Avenue, a distance of about a mile and a quarter, is crossed only by two subways and one street at grade. This is a condition that never would have arisen if the importance of Ottawa as the Capital had been considered. It is a serious menace to human life, and steps should be taken for its elimination at the earliest possible moment. Even if all the streets were open and the grades separated, it would at best be merely a makeshift, for just as long as this line is permitted to remain in its present location, it will restrict and retard the natural expansion of Ottawa in a southerly direction. If it is desired absolutely to correct the evil, the taking out of the line *in toto* is the only proper and satisfactory remedy.

The area lying between the Ottawa River and the cross-town line is showing indication of apartment house development and of more intensive use. The pressure of the business district southwards and the presence of the railway have been the influences at work. Much of this area will be taken by the business necessities of the future. Control and regulation should be imposed, to the end that this expansion be as regular and well ordered as possible.

The district south of the cross-town line, not as yet completely built up, shows much evidence of the deteriorating effect of industries and storage yards. The almost appalling absence of local improvements in the western portion is very striking, and the necessity for them very pressing.*

This central residential district is spreading into the area between the Canal and Rideau River. Much of this land, however, is subjected to floods, and cannot be fully developed until the river has been controlled. This, in its turn, together with the lack of bridges over both the Canal and River, blocks development further south on the high land. Proper street car service cannot be given under present conditions.

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* By local improvements is meant sidewalks, sewers, proper street grading, lighting, etc.

The Prescott Branch of the Canadian Pacific and the Chaudiere Branch of the Grand Trunk, have almost completely separated this central section of Ottawa from the newer development taking place to the west, where a large portion of Ottawa's future population will live. The only streets connecting these two sections, where the grades of the street are separated from that of the railway right-of-way, are Wellington and Somerset Streets. In this district, also, the effect of the railways on adjacent property, and the absence of local improvements, are very evident.

The Grand Trunk main line, west of Bronson Avenue, cuts up this western and newer residential section, while a large lumber area adds inconvenience. There is in this section much lack of order and much untidiness. The main line of the Canadian Pacific, with its many grade crossings, cuts off the area to the north between the tracks and the Ottawa River, and seriously retards development.

Hull

The residential areas of Hull are of very mixed character, and closely built up. The city is cut into a north and a south section by the approach to the Alexandra Bridge, and into an east and west section by Brewery Creek and paralleling railways. Much of the city requires local improvements. Abandoned quarries in the centre of the residential districts, full of stagnant water, should be filled in, and this menace to health removed.

Attention is called here to the fact that there is not a single park or playground in Hull.

It cannot be emphasized too strongly that in carrying out the re-planning of Ottawa and Hull, very much attention must be given to the protection of the residential sections of the cities against the encroachment of industrial and railway activity.

Drawing No. 19, Diagram "B," illustrates the districts in which it is proposed to segregate industries. It shows also the control suggested for the business and residential sections. This matter is discussed in detail in the section on "District Control."

The elimination of grade crossings merely by raising or lowering the railway tracks, would require a very large expenditure of money, without any general improvement of physical conditions. The money so expended would go a long way towards paying for the proposed re-arrangement of railway lines, while the cities will obtain real, permanent physical improvement. Details are discussed later, but in this general description, it is desired to lay very strong emphasis on the pressing necessity for consideration of these matters.

General Street System

The other consideration, mentioned above as being fundamental to the development of any plan, and on which the distribution and use of the areas of a city depend, is the street system.

The method used to analyse the street system is illustrated on Drawings Nos. 2A, 2B, 2C, 2D and 2E. Not all the plan is based on this analysis, but it forms the foundation from which study in arrangement was carried on.

Method of Analysis of Street System

The purpose of this analysis is to find some measure of the burden placed on a street by the area which the street serves, the assumption being that, in getting from one place to another, the natural tendency of traffic is to travel along the shortest route.

Important objective points or areas are chosen which are naturally and logically the points towards which traffic in general moves. From all sections of the cities, the shortest routes to the objective point are picked out along the existing streets. This method indicates whether the existing main lines of travel are so tortuous as to make advisable the creation of a new thoroughfare, or the extension of an existing one, so as to obtain a reasonably direct route. It shows also what streets are used, and what streets should be used.

This analysis and study has for its object, not only benefit for the travel of the future, but also the immediate improvement of conditions. The loosening up and co-ordinating of the street system is of importance now, and, if the main recommendations are carried out at once, present day travel will receive as much benefit as will the travel of the future.

Street Plan

A description of the present street plan logically begins with arterial highways of greatest importance. The routes of travel, to and from outlying points, generally become the main streets of the city, and form, with the cross connections, its arterial system.

The roads from Kingston, Toronto, Prescott, and Montreal are the ones of most importance. Of almost equal importance, from the point of view of present travel, are those from Aylmer, Chelsea, Russell and other nearby towns.

General Structure

The general structure of the street systems of the cities, shown on diagram, page 35, is dominated by the Ottawa River. Wellington Street, from Bronson Avenue to the Plaza Bridge, is the backbone to which the whole system of parallel and converging arteries and traffic centres is intimately related.

From each end of this backbone, dominant streets diverge in all direc-

tions. From the Plaza at the eastern end, Sussex, Rideau, Nicholas and Elgin Streets go off respectively to the north, east, southeast and south. From the western end, diverge Bridge Street to the north via the Victoria Bridge to Hull, Bronson Avenue to the south, while Wellington Street continues to the west. In addition to these, at right angles to Wellington Street at about its centre, Bank Street extends due south as a very important thoroughfare—in fact, one of the most important in Ottawa—unobstructedly across the railway, canal and the river, continuing clear out into the open country. These radial streets, though at present in places incomplete and inadequate, create, with Wellington Street, a very fortunate composition.

Bronson Avenue continues southwards to and stops at the Rideau River, where a bridge would give proper connection to the road along the east bank of the river to the south and southwestern country. Bank street is too narrow for its traffic. Elgin Street stops practically at the Rideau Canal, and access to the district to the south of the canal is indirect.

The western, northern and eastern arteries of Hull are also intimately related to the composition, the Aylmer Road and Chelsea Road connecting with Wellington Street in Ottawa by means of Victoria Bridge, and Laurier Avenue and the King's Road by Alexandra Bridge.

Connections with Cross Country Highways

Many of these thoroughfares in Ottawa and Hull extend beyond the limits of the city, and connect with highways leading to other cities and towns. Sussex Street and Rideau Street become the arteries through Ottawa to the highways from Montreal; Nicholas and Bank Streets to the Morrisburg Road; Bronson Avenue to the Prescott and Ogdensburg Road, and Wellington Street to the Toronto, Carleton Place and Renfrew Roads.

In Hull, the Aylmer Road continues westward along the north bank of the river; the Chelsea Road extends to Maniwaki; Laurier Avenue, connects with the King's Road, which extends along the north side of the river through to Montreal.

Cross-Town Thoroughfares

Besides the absence of sufficient connection between the various sections of Ottawa as noted above, there is a distinct lack of cross-town connection, and improvement must be made by providing continuous unobstructed thoroughfares.

Laurier Ave.

It is desired to lay very strong emphasis on the importance of Laurier Avenue. Topographical conditions force the use of Wellington Street by all sorts of traffic, as the east and west thoroughfare in the business section of the city. Traffic passing between the western industrial and railway

centres, and from the country to the west, is forced to use this street to reach the eastern railway, industrial and warehouse centres.

It is an unfortunate condition that vehicles of every sort and description have to use this street, and to pass the Government Centre. With the growing importance and the enlargement and expansion of the Federal Buildings, this condition will become more and more objectionable.

It is impossible to consider Sparks Street as a street to which this heavy traffic from Wellington Street can be removed. It is too narrow, and is already seriously congested by car tracks and shopping vehicles.

Laurier Avenue would offer itself as an ideal substitute, were it not for the fact that access to it, at its west end, is completely stopped by cliffs, and that travel at the east end is inconvenienced by the height of the bridge over the canal and railway, due to the great clearance at present required over them. It would furthermore make a more direct cross-town connection if opened as a through thoroughfare with a better and easier grade.

Somerset St. There is necessity for bridges at the Rideau Canal and Rideau River, on the line of Somerset Street, so that Somerset Street can be made a through cross-town street, giving connection between the extreme eastern and western sections of the city, without going through the congested streets of the business centre.

Carling Ave. Carling Avenue also lacks continuity, by reason of the absence of crossings at the canal and river, and is obstructed by dangerous grade crossings at the railways.

Ottawa and Hull Connection A fact to which we would call attention is the narrowness of the connection between Ottawa and Hull at the western end of the city. The industrial areas at the ends of the Victoria Bridge develop a considerable volume of traffic between the two cities, of a character which is vehicular, street car and pedestrian. The large number of people and vehicles, passing over these bridges in the course of a day, is a measure of the advisability of developing a better and more commodious means of communication.

Subordinate Street System and Subdivisions of the City The arterial roads inside of Ottawa make convenient divisions of the city for the description of the minor or subordinate street system. There are five subdivisions which are shown on Diagram, page 35, and lettered A, B, C, D, E.

Sections "A" and "B" In sections A and B, the Rideau River, the Canal and the railways are responsible for the dead-ending of very many of the streets.

From the Edwards Mill to Hurdman's Road, a distance of about two miles and a half, there are five bridges crossing the Rideau River, two of which are close together near the Mill. Between Rideau Street and Hurdman's Road, a distance of over a mile, there are no bridges crossing the river. The approach from the west to the bridge at Rideau Street is steep and indirect, and it would be difficult to make street car extension over it. The area adjacent to the river, as shown on Drawing No. 19, Diagram "A," is subject to flood, further interfering with the streets.

The Sussex Street Branch of the Canadian Pacific adds further inconvenience in these sections, on account of the fact that all streets which cross it are at the grade of the railway. Further east the streets are crooked, and there is a great lack of convenient through highways. West of the Rideau River, the north and south streets at the north end of section A, have to cross the Sussex Street yard at grade, and at the south end of section B, are blocked by the Canadian Northern Railway property, north of Hurdman's Road. There is poor and only indirect connection to Hurdman's Road, the highway leading to the southeast of the city.

Section "C"

The Rideau Canal and the railways adjoining it, separate completely the two sections A and B, from section C. From the Plaza down to the point where the Grand Trunk Railway crosses the canal, there are only two bridges in a distance of one mile and a quarter. One of these bridges, that at Laurier Avenue, is very high, and the long ramps make approach more or less difficult. The only streets crossing the railways between the above mentioned points are the separated crossings at Laurier and Gladstone Avenues, and the grade crossings at Main Street and Echo Drive.

Between the Grand Trunk Railway and Bank Street, there is no bridge crossing the canal in a distance of about one mile and a half. Between Bank Street and Bronson Avenue there is no bridge crossing the Canal in a distance of half a mile.

Of streets crossing the Rideau River in section C, there is but one, at Bank Street, although the whole length of the river through this section is nearly three miles and a quarter.

Immediately to the south of the Rideau River, while there are several streets crossing the Canadian Pacific and the Canadian Northern Railways, there is only one which has separated grades, and that only over one of the railways,—Bank Street which crosses under the Canadian Northern but is a grade crossing at the Canadian Pacific.

In regard to the streets in section C further inside the city, it will be seen that they are greatly interfered with by the cross-town line of the Grand

Trunk Railway. From Hurdman's Road to Bronson Avenue, a distance of about one mile, there are only two streets which are not at grade with the tracks, Elgin Street and Bank Street; Bronson Avenue is at grade. Just west of Bronson Avenue there are two streets crossing the tracks on bridges.

It is clear that efforts should be made to improve the conditions surrounding the streets across the Canal and the Rideau River. The necessity for improvement along the railway has also been pointed out.

One of the worst conditions in the street system of the city is found in the streets passing from the east to the west, across the railways between sections C and D. In a distance of one mile there are only two streets, Wellington Street and Somerset Street, crossing the railways on bridges, and these two streets are close together.

The effect of these railways on the street system is shown on Drawing No. 10. Most of the streets do not even cross the railways at grade. The lumber yards and Dow's Lake add further inconvenience of passage between the two sections.

Section "D"

Looking at the details of the streets in section D, it will be noticed on Drawing No. 10, that few of the streets cross the railways with separated grades. Many of them do not cross the railways. Attention is also called to the lack of consideration given by the subdividers of property to the making of at least some of the streets continuous through two or more subdivisions.

Section "E"

Passing to section E in Hull, we are faced again with lack of continuity of the street system, in respect to ways of crossing over the railways and over Brewery Creek. With the exception of a few streets crossing the railway approach to the Alexandra Bridge, where the grades were of necessity separated, the grades of no other streets in Hull are separated from those of the railways.

In a mile stretch from the Aylmer Road due northwards, there are only two streets continuous across either the railway or Brewery Creek,—the Aylmer Road and Montcalm Street. There are at present no streets across the cement company's property. The same is true of the by-pass waterway between the Gatineau and Ottawa Rivers. Only two bridges, in a distance of about one mile, cross this waterway. Across the Gatineau River to the east, there is only one bridge within any reasonable distance of Hull, in fact, within three miles of the city. Severe street grades in Hull make passage across the city itself difficult and inadequate.

RECOMMENDATIONS

The recommendations, to which it is desired to give emphasis and prominence in this report, are described immediately hereunder. For full description of some of them, reference is made to other sections of the report. The recommendations as to major street and highway improvements are given in detail. The major recommendations are those to which the authorities should give immediate consideration. Minor recommendations, those which may be undertaken with the further development of the city, and in the future when opportunity and convenience permit, are made without detailed description.

The major recommendations are as follows:

Federal District

(1) The formation of a Federal District for Ottawa and Hull, is very strongly urged.

Railways

(2) A complete and comprehensive re-planning of the railway lines should be carried out as soon as possible.

From the description given above of Ottawa and Hull, and of the conditions surrounding the development of property and street system in the various sections, it will be readily seen that most of the street imperfections can best be improved by a complete rearrangement of the railways. Some of the difficulties can be removed at great expense by grade separation, a method, however, which would leave the other conditions as bad as they are to-day.

This question requires much detailed description and discussion, and attention is directed to the section devoted to it.

Briefly, the plan recommended is as follows:

A Union Passenger terminal on the site of the present Central Station.

Two general freight areas,—one along the Rideau Canal south of Laurier Avenue, and one at Broad Street.

A tunnel connecting the Central Station and eastern area with the Broad Street area and the line to the west, and the operation of all passenger and local freight trains through this tunnel.

The ultimate abandonment of portions of two of the main lines east of the Rideau River; of the cross-town line of the Grand

Trunk Railway as far out as Britannia; of the Prescott Branch and Sussex Street Branch of the Canadian Pacific Railway and the Chaudiere Branch of the Grand Trunk and of much of the railway mileage in Hull.

Should this plan be carried out as described in the section on "Railways and their Terminals," Ottawa and Hull will have but one street which crosses a railway track at grade, and that track a waterfront siding.

Government Buildings

(3) The extension and development of the Government Buildings should be carried out. Attention is directed to the section devoted to this subject.

District Control

(4) It is recommended that the authorities take steps to segregate industry into certain areas, to control the districts devoted to business and light industry, to control and protect the residential districts and to control the height of buildings, by passing the necessary building by-laws and regulations. Briefly, the Commission's recommendations are:—that in Ottawa, two districts be set aside for heavy industry, one on the east at the junction of the railways, and one on the west at Chaudiere Falls, and that, in Hull, industries be segregated into two districts, one at the Chaudiere Falls, and one in the area proposed for reclamation at Leamy Lake. For the details of this, and of the control of the business and residential districts and of the height of buildings attention is directed towards the section on "District Control." Recommendations are illustrated on Drawing No. 19, diagram "B".

Overflow Rideau River

(5) It is strongly recommended that immediate attention be given to the control of the overflow from the Rideau River. This is discussed in the section on "Control of Rideau River."

National Park

(6) In Part I. strong recommendation is made for the acquiring by the Government, as a National Park, of some 75,000 to 100,000 acres to the north and northwest of the city. As much as possible of the country of the Laurentian Hills and of the chain of lakes there should be included in these reserves, and the preservation of its resources undertaken.

It would not be necessary to dispossess completely or remove the present owners of the land. They might be allowed to remain and act as fire, game, and timber wardens. All that would be necessary would be to bring the protection of the timber and other natural resources on their property under the direct control of the Government.

With very little expenditure of money, this large area could be kept in its natural condition for the interest and recreation of the people of the Dominion. There are few localities in Eastern Canada which lend themselves so well to this use.

Diagonal Connection in Ottawa

(7) To provide proper means of connection between the two portions of the business section east and west of the canal, to improve the street connections between the east and west sections of the city, and to relieve Wellington Street and the Plaza Bridge of as much of the heavy traffic as possible, it is recommended that a diagonal street on a viaduct over the railway and canal be constructed from the intersection of Laurier Avenue and Elgin Street to the intersection of Rideau and Dalhousie Streets.

While this improvement cannot be completed as a whole until the railway recommendations are carried out, arrangements for it, looking to its ultimate accomplishment, should be given consideration immediately. It will be of the utmost service. Apart from its purely utility value, it will do much to enhance the appearance of the railway entrance to the city and the suggested Municipal and Post Office sites, see Drawings Nos. 5 and 6.

Laurier Ave.

(8) Strong reference has been made to the desirability of freeing Wellington Street from use by heavy truck traffic, which passes between the east and west railway and industrial business centres. It has been pointed out that Sparks Street is too congested and too narrow to be of any service in carrying this traffic. It is therefore recommended that Laurier Avenue be developed as the main east and west carrying artery. This should be done before much improvement is undertaken in the building up of Wellington Street for Government purposes, and before the railway and street car tunnels are constructed.

To provide the necessary access through the cliff at the west end of Laurier Avenue, it is recommended that a tunnel be constructed connecting Laurier Avenue with Albert Street

and at a grade not exceeding 1½%. (See Drawings Nos. 3 and 4.)

It will be necessary to widen Laurier Avenue, from Bay Street to the top of the cliff, to about 130 feet, in order to provide for the portal of the tunnel, and at the same time make proper connection between Laurier and Bronson Avenues.

It is proposed to widen Laurier Avenue from Bay Street eastward to the Rideau River. The present width of the street is 62 feet. This street should be widened to at least 86 feet.

It is proposed that the Laurier Avenue bridge, which crosses the canal and the railway, be constructed with a clearance of not more than 17 feet above the railway tracks and a minimum of 12 feet over the canal, and that the approaches to this bridge be made as easy and convenient as possible. This matter of clearance, over the railroad tracks and canal, should be given immediate attention. Changes in the requirements of the Dominion Railway Board for clearance over the railway, and in the requirements of the Department of Railways and Canals for clearance over the Rideau Canal, will be necessary. These matters are discussed in the sections on "Railways and their Terminals" and "Water Transportation."

The widening of Laurier Avenue should be carried out by the establishment of an homolagous line. Wherever practicable, this is the simplest, most economical and easiest method for widening a street. It consists in the establishment of a building line in front of which no new buildings are allowed to be constructed, and the application of the principle is that no matter at what date buildings are rebuilt on or behind the newly established line, the value of land so acquired by the municipality is determined by agreement or arbitration, as of the date of the official establishment of the line. Laurier Avenue lends itself admirably to this process, and no time should be lost in putting it into effect. There are but few buildings which come out to the present street line, though it may be expected that with the expansion of the down-town centre in the next few years, business development will take place along this street, and buildings of a more expensive and permanent character than now exist will be constructed, the removal of which will make the widening of the street very expensive. At present, it would cost comparatively little.

Somerset St.

(9) It is strongly recommended that Somerset Street be developed as a cross-town artery. It should be widened from Bronson Avenue west to Wellington Street. Its elevation across the railway tracks at the west end should be lowered. A bridge at as low an elevation as possible should be constructed at the east end across the railway tracks and canal, so that convenient and easy approaches may be provided.

The extension of Somerset Street across the Rideau River on a new bridge is very important. A new bridge is very necessary across the river at about this point and Somerset Street as a through east and west cross-town artery fixes the exact location. The approaches to this bridge should be made as easy as possible so that it may be serviceable for vehicular, pedestrian and street railway travel.

Somerset Street should be extended to the east out through the unplatted area as an arterial highway.

Elgin St., Bank St., Bronson Ave.

(10) It is recommended that Elgin Street, Bank Street, and Bronson Avenue be widened, South from Laurier Avenue, to not less than 86 feet. This can best be accomplished by establishing an homolagous line.

It is recommended that bridges be constructed over the canal at Elgin Street and over the Rideau River at Bronson Avenue.

It is further recommended that Bronson Avenue be extended southerly into the unplatted area south of the Rideau River.

Street Car Subway and Extensions

(11) It is strongly recommended that, when the construction of the tunnel between the Central Station and Broad Street is undertaken, provision be made for a street car subway under Sparks Street or Wellington Street. The growing congestion on Sparks Street will require close attention, and when its capacity is reached the street cars should be removed. As shown in the section on "Street Railway and Other Utilities," the best and least harmful method of regulating the congestion on Sparks Street is by the construction of a street car subway under Sparks or Wellington Street. Extensions of this subway should be carried along Elgin Street and Bank Street. The points where the street cars would enter the subway would be, on the east at the Plaza Bridge, on the south on Elgin Street at Cartier Square and on Bank Street just

south of Laurier Avenue, and on the west at the foot of the bluff near the intersection of Bronson Avenue and Wellington Street.

Certain recommendations are made in the section on "Street Railway and Other Utilities" for the extension of street car lines to new sections of the city, and methods for the development suggested. Attention is directed to this section.

Rideau River Bridges

(12) It is recommended that new bridges across the Rideau River be constructed at Somerset Street, at Gladstone Avenue, on the extended line of Brunswick Street southerly from its intersection with the production of Carling Avenue, about midway between Carling Avenue and Main Street, at Main Street and at Bronson Avenue. It is proposed also, that as much as possible of the present Grand Trunk bridge west of Hurdman's Bridge, be used as a highway crossing when the railways are re-arranged.

Rideau Canal Bridges

(13) The following new bridges are recommended over the Rideau Canal:

At Somerset Street, at the bend of the canal, at Main Street, on the line of Carling Avenue, at Fifth Avenue, at the Exhibition Grounds and at Craig Street extended. Recommendations as to the character and heights of these bridges are discussed in the section on "Water Transportation," and attention is directed to that section. It is recommended that the clearance over the canal be reduced to about twelve (12′) feet. It is proposed also, that as much as possible of the present Grand Trunk cross-town bridge and the Canadian Pacific Prescott Line bridge be used as highway crossings when the railways are re-arranged.

Platting of Outlying Areas

(14) It is recommended, in order that an arterial system may be correctly and economically built up in the undeveloped sections outside of the cities, that the trunk arteries for the future structure be laid down immediately in their proper location, and that all subdividing of property be required to recognize them. These should connect up with the arteries within the present cities.

In the outlying areas in Ottawa and Hull, the future through streets will thus be provided without excessive cost, and will be continuous over the various pieces of property owned by different individuals. The character of the subdividing between the trunk arteries may be left to individual initiative, although a sug-

gestion is shown on the drawings. Too much attention cannot be given to this whole question.

Parks and Parkways

(15) A general plan for the development of parks and parkways is discussed in a section devoted to that subject. Recommendation is strongly made for forethought in this matter, so that maximum economy may be practised. Ottawa already has a good park system, and the Ottawa Improvement Commission has the situation well in hand, and has done excellent work, but Hull is absolutely without any parks at all. It is recommended that a proper park system be developed immediately for that city. Kettle Island and Upper and Lower Duck Islands should be acquired by the authorities as park areas.

Hull Improvements

(16) While the above general improvements apply equally to Ottawa and Hull, certain specific improvements should be undertaken in the latter city as soon as possible.

It is recommended in the section on "Railways and Their Terminals" that the railway passenger and freight station be moved to the line connecting the Alexandra Bridge with Maniwaki Junction, and that certain lines be abandoned.

It is recommended that Aylmer Road, Chelsea Road, Laval Street and Laurier Avenue be widened to 86 feet; that a highway be constructed paralleling the railway from Laurier Avenue to St. Redempteur Street, and that it be extended to intersect with Chelsea Road.

It is recommended that the swamp land north of Brewery Creek be reclaimed, and a large part of it devoted to industrial purposes.

Four new bridges are recommended across Brewery Creek and one across the Gatineau River.

It is proposed to park the banks of Brewery Creek, the Gatineau River and the Ottawa River, interfering as little as possible with the industries established there. Many minor street improvements and short connections are recommended as shown on the drawings.

Municipal and Railway Centre—Ottawa

(17) As in other cities, Ottawa's Municipal Government is subordinated to the Federal Government, both in fact and in its relation to the city plan.

Its present location is both convenient and correct in this sense. The plan, shown on Drawings Nos. 5 and 6, suggests the ideal arrangement to be reached through progressive development.

The proximity of the railway passenger terminal to the Government and Municipal Buildings affords an opportunity of composing these elements around one large plaza. This would be formed by extending the present plaza at the intersection of Sparks and Wellington Streets southwards as far as the proposed diagonal link, covering over the canal, the docks and the railway tracks. This will serve the double purpose of enlarging the railway terminal facilities and of gaining a traffic centre of ample dimensions. Open spaces, to furnish light and air to the canal and docks, would be provided. The future Municipal Buildings should be placed so that they occupy the west side of this new plaza, with the Railway Terminal and Post Office occupying the east side. The new Post Office should be placed over the tracks. The incoming passenger may reach this proposed plaza directly from the concourse and find himself in a group of imposing buildings with a fine view of the Parliament Buildings beyond.

Between the proposed City Hall and the diagonal link from Rideau Street to Laurier Avenue, there will be a valuable building site now largely owned by the authorities, subject to sale or lease for business purposes. There will also be a large space under the surface of the plaza and adjacent to the canal, which may be used for storage of city supplies or rented for commercial storage.

In order to obtain an orderly architectural scheme worthy of this plaza, the facades of the buildings adjacent to the City Hall should be subject to control as to height, colour, material and architectural treatment.

Ottawa River Bridges

(18) New bridges are recommended over the Ottawa River, at such time in the future as necessity arises.

One bridge should be placed at the Little Chaudiere Falls. A second new bridge is recommended to connect the end of Wellington Street at Bronson Avenue with the Municipal Centre in Hull. This should be a high level bridge of monumental character. While this bridge is shown in the plan as having but one level, it may be found desirable at a later date to provide two levels, one for transportation and one for general traffic. The

present traffic conditions surrounding the Victoria Bridge suggest this high level bridge as an improvement of the near, and not the remote, future.

A third bridge is recommended just below the mouth of the Gatineau River.

It is almost unnecessary to point out that in the construction of the Victoria Island Bridge and the bridge over the mouth of the Gatineau River, care must be taken that the piers do not in any way interfere with the breaking up and free flow of the ice.

Control of Waterways

(19) The restriction and development of waterways for use as recreational park and pleasure purposes, as far as possible, are recommended. Control and development of the Ottawa River shore line, and the construction, wherever possible, of continuous driveways along that waterway, and also along the Rideau Canal and Rideau River, are urged.

The Hull Shore and Laurier Ave. (Hull)

Development of the waterfront for commercial purposes is discussed in the section on "Water Transportation," and specific recommendations are made for the location of water terminals. The Hull shore is at once the foreground to the great view from Parliament Hill, and the position from which the whole Government group may be best seen. Its proper treatment will complete the frame of the basin of the river lying between the two shores.

It is recommended that lands be acquired as indicated on the plans. Care has been taken that no real sacrifice will result to existing business interests, the mills being untouched and their shipping fronts undisturbed. Future additions to these mills should be controlled as to silhouette and general arrangement, and, if possible, in the future a large area of the flat land on the Hull side, now used for piling grounds and industrial purposes, can be bought up and used for park purposes.

Improvement of Victoria Island

It is desired here to call attention to the possibilities which exist in this direction around Victoria Island and the Chaudiere Falls. An ideal arrangement of Victoria Island and of its surroundings would be obtained on the basis of its becoming public property and being developed in the finest possible manner, as a continuation of the frame to the Basin of the Ottawa River, in front of the Government Buildings. Industrial and commercial considerations, however, force a modification of such an

idea. Victoria Island, and the waterfront in the vicinity, have to be given over to some extent for use as freight and passenger landings.

It is suggested, however, that the portion of the Island to the east of the proposed bridge, between Ottawa and Hull, be taken by the authorities, and developed in such a manner as to reserve its recreational advantages. The central portion of the Island, raised one storey high above the wharves, may be made to form a small park. The space under most of the park would be available for storage purposes. The park should be made accessible from the high level bridge, and also from the Victoria Bridge. Teamways should be provided between the lower, or wharf level, and the Victoria Bridge.

The western portion of Victoria Island and the adjacent areas should be re-arranged so that an orderly condition of this whole district may be obtained.

Connection between Parliament Hill and Government House

(20) It is recommended that dignified and proper connection be developed between Parliament Hill and Government House. This should take the form of a parkway skirting the Ottawa River. The construction of a bridge over the canal, connecting Parliament Hill with the road through Major Hill Park, leading to Lady Grey Road, would be the first step. The road through the Park, Lady Grey Road and Sussex Street, from this last named street to Rockcliffe Park, should be widened and the present untidy conditions improved. Suggestions on this matter, in more detail, are contained in the section on "Government Buildings."

Outer Highway Connections

(21) It is recommended that connections be made with the highways leading to Toronto, Montreal and other cities. The details of these are as follows:

Highways to National Park

Heyworth Road

Heyworth Road runs along the south edge of the Chelsea Hills, and should be developed as a boulevard to its connection with the Kingsmere Lake Road. Its width should be 86 feet. Where this road forks near Fairy Lake a new diagonal is recommended, passing the lake, and following the creek there to an existing wide street in Columbia Park subdivision. This new diagonal should be a parkway at least 250 feet wide.

Old Chelsea Road

Old Chelsea Road, which passes along the north side of the Chelsea Hills, should be widened to 86 feet. A new diagonal

extension of this road is recommended, passing Fairy Lake and connecting with the proposed low level diagonal above described. This connecting street should be 86 feet wide.

Gatineau Road

The existing Gatineau Road, along the west bank of the Gatineau River, should be further developed. From a point near Wright's Bridge, the route into Hull and Ottawa follows along the Gatineau Road to the Chelsea Road, and then along the diagonal highway to be constructed parallel to the railway to Laurier Avenue. There are other routes of access into Hull and Ottawa from this highway, via Fairy Lake and Gatineau Point. This road should be widened to 86 feet.

Renfrew Road

This highway follows along Wellington Street and Richmond Road, through Britannia and South March. It is recommended for development as a road 86 feet wide.

Carleton Place Road

From the Base Line Road, at its intersection with the Richmond Road, this highway should be developed.

Toronto, Kingston and Prescott Highways

The in-town artery for the highways to Toronto, Kingston, Smith's Falls, Prescott and Brockville, starts from Wellington Street and passes along Bronson Avenue, as far as Laurier Avenue. From this point a new street is recommended, running to the north of the House of Mercy Maternity Hospital, along the edge of the hill and southward in the block between Division Street and Lorne Avenue to Somerset Street. From this point south, the blocks between Division Street and Le Breton Street are acquired as far as the abandoned right-of-way of the Grand Trunk Railway. From there southwards, as shown on Drawing No. 8, it crosses the Ordnance Reserve to Carling Avenue. From this point the road passes through the Experimental Farm to the Base Line Road. There the road divides, the branch to Prescott and Brockville passing along the existing Manotick Road. It is intended that the traffic to Prescott follow the Manotick Road southward from the Base Line Road to the Rideau River, where a bridge and a new street are recommended. From there the traffic to Brockville will follow the west side of the Rideau River, and the traffic to Prescott and Ogdensburg either the west or the east bank of the Rideau River. The Prescott Roads should be improved and widened.

The Toronto Highway leads along the Base Line Road to Bell's Corners. It is recommended that the Base Line Road be widened to 250 feet, and developed as a parkway within the future platted area shown on the drawing. From Bell's Corners the present Toronto road through Richmond, Smith's Falls and Kingston is proposed for development.

Bronson Ave. Extension

An extension of Bronson Avenue southward to the end of the Concession Road at Walkley Road is recommended. The Concession Road should be extended along the line of the Canadian Pacific Railway for a distance of about six miles to the Prescott Road along the Rideau River. This should be 86 feet wide.

Morrisburg Road

From Wellington Street, the main connection to Morrisburg is carried southward along the Drive made by the Ottawa Improvement Commission on the west bank of the canal, to the new bridge over the canal near Gladstone Avenue. There it connects with a new street which crosses the abandoned Grand Trunk Railway property, and turns south along Brunswick Street to its intersection with the Carling Avenue extension, and across the new bridge over the Rideau River, from which point it runs almost due south over a new highway to a connection with the Metcalfe Stone Road near Leitrim Post Office. This street, within the future platted area, should be 125 feet wide.

Note:—It will be seen that the traffic now destined for Morrisburg and Prescott is forced to use Bank Street, which will be needed more and more as a local thoroughfare. The new route suggested will give the necessary relief.

Montreal Road

South of the Ottawa River, the existing highway is recommended for development and should be widened to 86 feet as far as Green's Creek.

A connection, following closely the line of the Ottawa River through Rockcliffe and the present Rifle Ranges to Green's Creek, should be developed as a parkway 125 feet wide, where possible. It would be an extension of the admirable park drive now existing.

Another route to Montreal, and one which would be of great interest, owing to its position along the north bank of the Ottawa River for a great deal of its length, is that which enters Hull along the King's Road. The present road should be widened to 66

feet outside the platted area, unless it carries a car line, in which case the width should be 86 feet. This road from Gatineau Point to Hull should be at least 125 feet wide and treated as a boulevard.

Improvement in Section "A"

The following is the list of minor improvements shown on the plan. These improvements are arranged for the purpose of description according as they lie in the different sections of the city shown on diagram, on page 35.

Extension of George Street eastward to St. Patrick Street Bridge, through the deep lots north of Rideau Street. Width of street, 86 feet.

Dalhousie Street to be widened to 86 feet over its entire length.

Sussex Street to be graded, planted, and the roadway widened to 60 feet.

Construction of a road, along the east side of the Rideau River on the right-of-way of the C.P.R. Sussex Street line when abandoned; and one from King Edward Avenue to Rideau Street on the west side of the river.

Re-arrangement of approaches to the Alexandra Bridge to be carried out when the railway scheme is developed.

Extension of Lisgar Road from Dufferin Road to Springfield Road, width 86 feet.

Section "B"

Diagonal street adjacent to and paralleling station development, when railway improvements are carried out; this street to be a viaduct, and to be extended southeasterly parallel with railway freight development from Laurier Avenue and Waller Street, replacing Nicholas Street as far as Gladstone Avenue; from this point, Nicholas Street to be widened. Thoroughfare to be 86 feet wide, if without car tracks; space required for ramps for the railway yard to be on railway property. If car tracks are added, the street to be widened accordingly.

Nicholas Street to be widened on railway property to 86 feet, between Rideau Street and Laurier Avenue.

Gladstone Avenue to be widened from Nicholas Street to the Rideau River, and extended easterly through unplatted area. Railway right-of-way to be used as a through artery, when railway is abandoned and to be developed as such with the platting of the outlying areas. Gladstone Avenue to be planted to screen industrial and railway district from residential areas.

Extension of Chapel Street southwards to Nicholas Street.

River bank drives along each side of Rideau River from Hurdman's Bridge to Rideau Street.

Section "C"

All rights-of-way abandoned in railway scheme to be used for highways.

Extension of Echo Drive across Canal and southwards to and across Rideau River, paralleling proposed railway development.

Widening of Main Street to 86 feet.

Completion of driveways on each side of canal and river.

Widening of Riverdale Avenue.

Use of Grand Trunk Railway right-of-way, when abandoned, as a highway.

Driveways through Central Park.

Section "D"

Wellington Street to be widened to 86 feet, from Bronson Avenue westward as far as Rosemount Avenue, except adjacent to railway development, where the width should be at least 150 feet.

Scott Street to be widened where it parallels railway, and extended eastward to connect with Wellington Street at the western freight development. Width of street to be not less than 86 feet.

Broad Street to be widened to at least 150 feet between Wellington Street and the north end of the railway development suggested at Broad Street.

A short diagonal from Laurier Avenue tunnel to Victoria Bridge, occupying Hill Street, Lett Street, and private property; this thoroughfare to be 86 feet wide.

Somerset Street to be extended through to Ladouceur Street and Carruthers Avenue, where it will connect with the approach to the new bridge over the Ottawa River, at Little Chaudiere Rapids; width of street to be 86 feet.

Carruthers Street, which leads directly from Wellington Street to the proposed new bridge over the Ottawa River at the Little Chaudiere Rapids, to be widened to 86 feet; a viaduct to be constructed over the Canadian Pacific Railway; extension of Carruthers Street southwards to Experimental Farm; width 86 feet.

A diagonal connection, 86 feet wide from Wellington Street and Carruthers Street southwest to Merivale Road at Carling Avenue.

Carling Avenue to be widened to 86 feet from Bronson Avenue westward to Richmond Road, and to be extended westward along the shore of the Ottawa River into Carp Road, at a width of not less than 66 feet, without car tracks and 86 feet if car tracks are constructed. This serves as a relieving connection to the Renfrew Road.

Hickory Street to be widened west of Division Street to 86 feet, and extended around the bluff at Irving Avenue, to the intersection of Carruthers and Wellington Streets; connection to be 86 feet wide.

Widening of diagonal road extending from Division Street and Carling Avenue to the Experimental Farm, and thence southwestwardly a short distance from the Rideau Canal; this road should be straightened; width of street not less than 100 feet.

Widening of highway which parallels the Rideau River a short distance from the waterway, from the intersection of Bronson Avenue extended and the Rideau River; this street to be not less than 86 feet.

Widening of Strathcona Avenue and extension southwards to Merivale Road; thence southeasterly through unplatted area to connect with highway along Rideau River.

Through east and west street about midway between Carling Avenue and Richmond Road to be recognized in the platting of this district, and to be opened up across areas already platted. Street to be 86 feet wide.

Use of abandoned railway rights-of-way in this section, as highway arteries.

Driveways along each side of the Rideau Canal and the Rideau River to be constructed in this section.

Construction of River Road along the Ottawa River from Chaudiere Falls to Britannia.

Section "E" Hull

A diagonal street from Main Street to the intersection of St. Joseph and Maisonneuve Streets as the approach to the new bridge connecting Ottawa and Hull at Victoria Island.

Extension of Laval Street from beyond Main Street over Philemon Island to connect with the Victoria Bridge.

Widening of Ravine Street to 86 feet, and the extension of this street through to connect with Montcalm Street.

Widening of Montcalm Street to 86 feet, as far as Chelsea Road.

St. Redempteur Street to be widened to 86 feet from Main Street to the proposed diversion of Brewery Creek.

Aylmer Road to be connected, by the extension of the Chelsea Road southerly, with the proposed new bridge over the Ottawa River at the Little Chaudiere Rapids.

Main Street, Hotel de Ville Street and Laurier Avenue, to be widened

to 86 feet; Laurier Avenue to be extended, 86 feet wide, over Brewery Creek to connect with the King's Road.

St. Laurent Street to be widened to 86 feet.

Extension and development of roads along Brewery Creek, and the Gatineau and Ottawa Rivers.

Traffic Restrictions

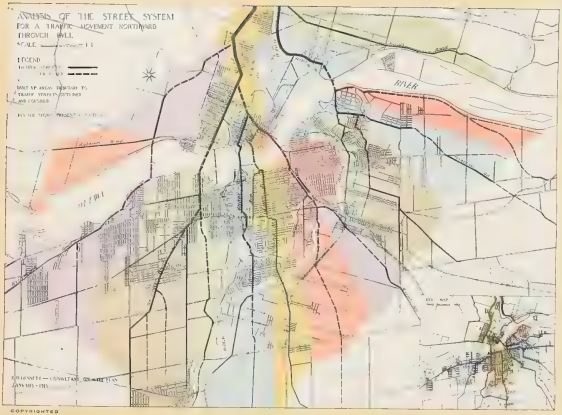
It is recommended that as the above improvements are carried out, traffic restriction be placed on certain streets in the city. It is not desired, however, to eliminate from thoroughfares street car traffic, but it is desired to emphasize the public benefit which may be derived from the carrying of street cars down boulevarded or parked thoroughfares. It is desired, however, to eliminate heavy trucking from such thoroughfares wherever other routes of travel exist.

DRAWING No. 2A

Analysis of the Street System for a Traffic Movement Northward through Hull.

DRAWING No. 2A

Analysis of the Street System for a Traffic Movement Northward through Hull.

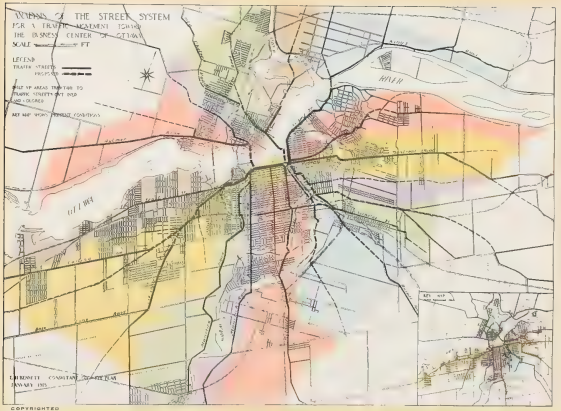


DRAWING No. 2B

Analysis of the Street System for a Traffic Movement toward the Business Center of Ottawa.

DRAWING No. 2B

Analysis of the Street System for a Traffic Movement toward the Business Center of Ottawa.



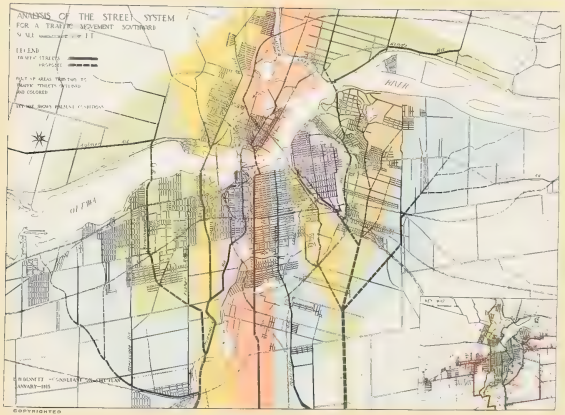
E. H. BENNETT, CONSULTANT ON CITY PLAN
JANUARY, 1915

DRAWING No. 2C

Analysis of the Street System for a Traffic Movement Southward.

DRAWING No. 2C

Analysis of the Street System for a Traffic Movement Southward.

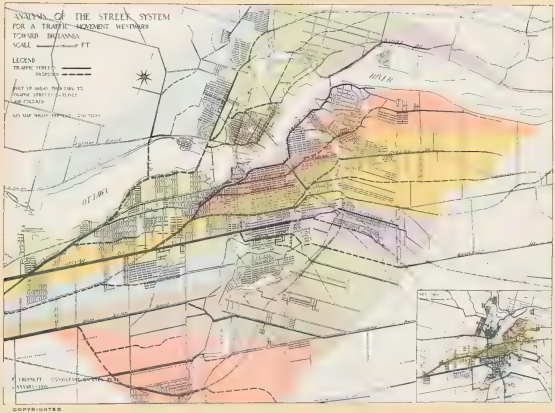


DRAWING No. 2D

Analysis of the Street System for a Traffic Movement Westward toward Britannia.

DRAWING No. 2D

Analysis of the Street System for a Traffic Movement Westward toward Britannia.



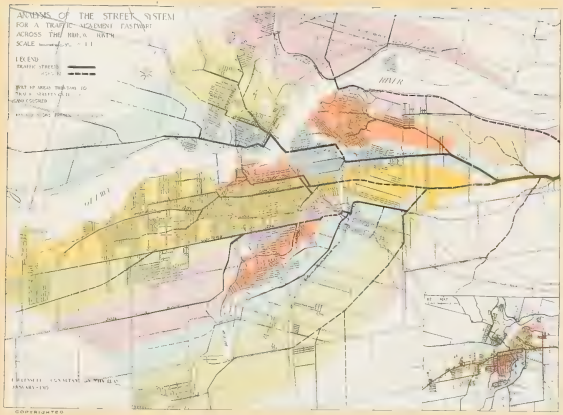
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JANUARY, 1915.

DRAWING No. 2E

Analysis of the Street System for a Traffic Movement Eastward across the Rideau River.

DRAWING No. 2E

Analysis of the Street System for a Traffic Movement Eastward across the Rideau River.



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JANUARY, 1915.

DRAWING No. 3

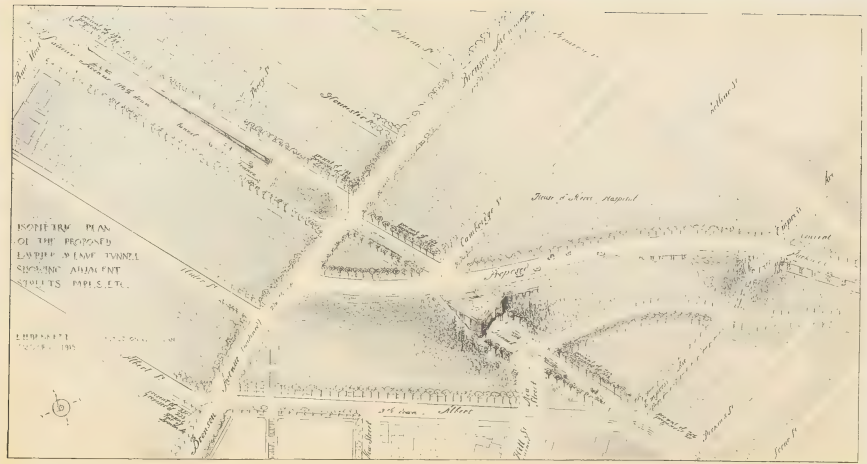
Isometric plan of the proposed Laurier Avenue tunnel, showing adjacent streets, parks, etc.

This tunnel connects Albert Street with Laurier Avenue, and passes under Bronson Avenue. Recommended changes in levels and grades of affected streets are also shown.

DRAWING No. 3

Isometric plan of the proposed Laurier Avenue tunnel, showing adjacent streets, parks, etc.

This tunnel connects Albert Street with Laurier Avenue, and passes under Bronson Avenue. Recommended changes in levels and grades of affected streets are also shown.



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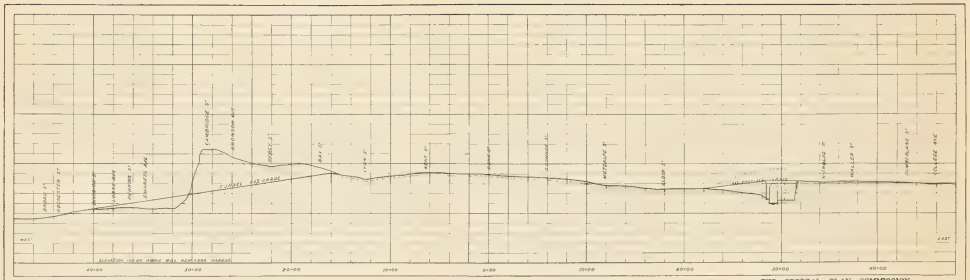
F. H. BENNETT, CONSULTANT ON CITY PLAN
JANUARY, 1915.

DRAWING No. 4

Profile of Laurier Avenue
Showing proposed Tunnel under Bronson Avenue
and Low Level Bridge over Rideau Canal

DRAWING No. 4

Profile of Launer Avenue
Showing proposed Tunnel under Bronson Avenue
and Low Level Bridge over Rideau Canal



PROFILE OF LAVRIER AVENVE
SHOWING PROPOSED TVNNEL VNDER BRONSON AVENVE
AND LOW LEVEL BRIDGE OVER RIDEAV CANAL.

SCALE.
HORIZONTAL
VERTICAL

THE FEDERAL PLAN COMMISSION
OF OTTAWA AND HVLL
CANADA
E.H.BENNETT CONSVLTANT ON CITY PLAN
E.L.COVSINS CONSVLTING ENGINEER
JANVARY 1915.

DRAWING No. 5

City of Ottawa—View of the proposed municipal and railway centre, looking north toward the Parliament Buildings, indicating re-arrangement and extension of the streets from the proposed "Diagonal Link" to connect with the Plaza Bridge and the Central Station. Proposed Post Office on the right and proposed City Hall on the left.

A plan of the above is shown on Drawing No. 6.

DRAWING No. 5

City of Ottawa—View of the proposed municipal and railway centre, looking north toward the Parliament Buildings, indicating re-arrangement and extension of the streets from the proposed "Diagonal Link" to connect with the Plaza Bridge and the Central Station. Proposed Post Office on the right and proposed City Hall on the left.

A plan of the above is shown on Drawing No. 6.



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JULES GUERIN, LANDSCAPE ARTIST.
JANUARY, 1915.

DRAWING No. 6

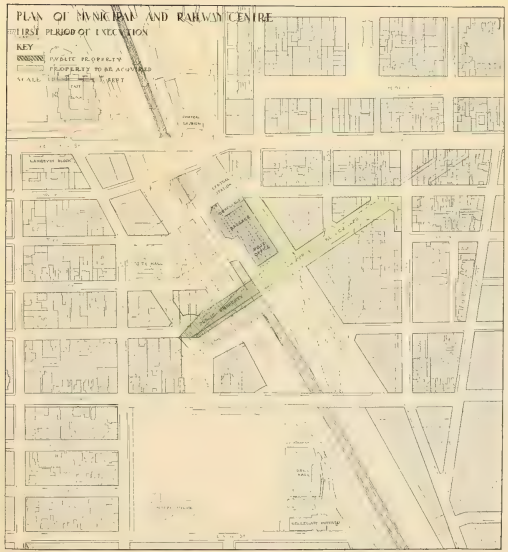
Plan of the Municipal and Railway Centre.

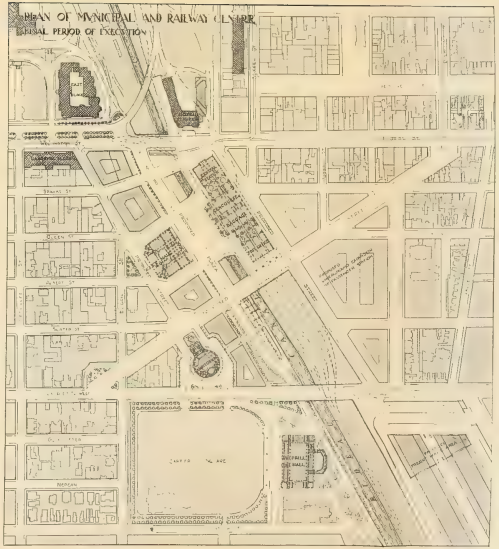
The "Diagonal Link" is shown in its relation to this group. The improvement of Cartier Square, Laurier Avenue and north end of the freight development are indicated. With this project the Laurier Avenue Bridge across the canal will be lowered as recommended in the report.

DRAWING No. 6

Plan of the Municipal and Railway Centre.

The "Diagonal Link" is shown in its relation to this group. The improvement of Cartier Square, Laurier Avenue and north end of the freight development are indicated. With this project the Laurier Avenue Bridge across the canal will be lowered as recommended in the report.





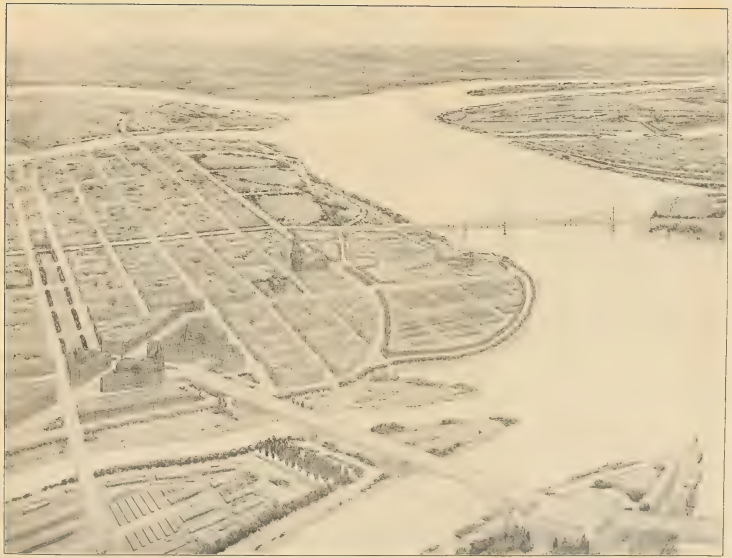
E.H. BENNETT CONSULTANT ON CITY PLAN
E.L. CASSIUS CONSULTING ENGINEER
JANUARY 1915

DRAWING No. 7

City of Hull—View looking east over the water-front, showing proposed bridge from Wellington Street, Ottawa, to the Hull municipal centre. Suggested improvement of Victoria Island for both recreation and commerce and an orderly treatment of the river banks without interfering with existing industries.

DRAWING No. 7

City of Hull—View looking east over the water-front, showing proposed bridge from Wellington Street, Ottawa, to the Hull municipal centre. Suggested improvement of Victoria Island for both recreation and commerce and an orderly treatment of the river banks without interfering with existing industries.



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JULES GUERIN, LANDSCAPE ARTIST.

DRAWING No. 8

Map of the highway system showing parks and forest reserves in the vicinity of Ottawa and Hull.

The existing highways proposed for development, and recommended connections and routes to important distant points are shown. The forest reserves are indicated as to general location, the exact boundaries being left for further study. The area hatched in orange indicates the platted area shown on Drawing No. 21, "The General Plan."



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DRAWING No 9.

Plan of the Central Area showing existing and recommended streets, parks and public buildings.

This drawing is a detail record of the scheme as outlined on the "General Plan."



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JANUARY, 1915.

PART III.

SURVEY

RAILWAYS AND THEIR TERMINALS

GOVERNMENT BUILDINGS

DISTRICT CONTROL

PARKS, PARKWAYS AND PLAYGROUNDS

WATER TRANSPORTATION

STREET RAILWAY AND OTHER UTILITIES

CONTROL OF RIDEAU RIVER

SURVEY

With the establishment of the Federal Plan Commission office at Ottawa in November, 1913, active work in the field was immediately commenced, with the object of preparing plans showing the existing conditions as to streets and highways in the cities of Ottawa and Hull and surrounding country, together with the existing conditions as to rail and water transportation, topography and public utilities.

The Commissioners were unable to obtain maps showing in detail the desired information in connection with these features, and therefore laid down the basic lines of the surveys as above outlined. Without such information as this, it was impossible to proceed with the study of the development plans, having in view the future execution of the work.

The topographical survey was made with sufficient accuracy to enable it to be used as the foundation for the laying down of an accurate map of the cities on a scale of 400 feet to the inch. There was kept in mind, at the time of making the survey, that at some time in the near future it would be enlarged as to scope and detail.

The courses of the principal streets and roads were first run and triangulated within and beyond the city limits, and the courses of the Ottawa and Rideau Rivers and the Canal were determined, and accurate shore lines established.

Elevations, with the mean sea level at New York as the datum plane, were established along the principal thoroughfares, and contours of the cities laid down with such detail as was found necessary for particular locations.

Such information as could be obtained from other sources was made use of, particularly from the plans of the Ottawa River Storage Branch of the Public Works Department, the plans of the various railway companies, the topographical map of Ottawa prepared by Mr. Cauchon, the established elevations of the city, the topographical plans of the Militia Department and the subdivision plans on file in the City and County Registry Offices and the offices of the Township Clerks. With the co-operation of the City Officials, it was possible to make a complete survey of the population of the cities at various periods and the distribution of the present population was accurately established. The large tracts of privately and publicly owned lands were also determined.

Subsurface and supersurface structures belonging to all public utilities were investigated. These included existing sewers, water mains and underground conduits, together with all light, telephone, telegraph and power transmission lines.

A general survey was made of the tree planting conditions on the streets throughout the cities.

Considerable research was made of economic growth and records were established of the industrial and business development at different dates.

In the surveys applying to the railway situation, in addition to obtaining records as to the physical layout of the tracks and general facilities, data were collected in considerable detail to show the intensity and volume of the different classes of railway business within the cities. Detailed information was obtained as to the distribution throughout the cities of various classes of freight.

A survey was made of the street railway facilities as applied to trackage, cars, and the passengers carried. The number of passengers carried on the various lines for 18 hour periods was recorded, from which it was possible to determine the average service rendered to the public.

Detailed information was obtained as to the number of Government employees, and the location of all space owned and rented by the Government.

Considerable attention was given, in co-operation with the Assessment Departments, to the relative values of real estate throughout the cities.

In various localities where alterations and improvements of considerable magnitude were to be recommended by the Commissioners, detailed surveys were made.

A large number of photographs were taken throughout the district to illustrate special features of the survey.

Careful investigation was made as to the volume and nature of the business handled on the Rideau Canal and the Ottawa River, as directly applying to Ottawa and Hull.

All this information is on file in the records of the Commission.

The work of the Ottawa Improvement Commission, of the public authorities of the cities of Ottawa and Hull, and of the Public Works Department of the Government has been carefully considered in the plans submitted. Suggestions of various private and semi-public organizations have been recognized, among them being those of the railway companies, of ex-Mayor Hopewell, and of Mr. Cauchon on various civic matters, of Mr. Bell for the improvement of the channel of the Rideau River and of the Conservation Commission.

RAILWAYS AND THEIR TERMINALS

General Policy Underlying Study

In studying the relation of the railways within the cities to the development of the cities, the following fundamental considerations underlie any possible solution for future arrangement:

(1) The reduction of the number of entrances into and lines within the cities to a minimum.

(2) The retention of areas within the cities of the smallest extent, compatible with the requirements for the freight and passenger business.

(3) The acquirement and development of areas in locations that will not restrict the proper expansion and growth of the cities.

(4) The removal to outlying areas of as much of the railway activity as possible, and the intensive use of all restricted railroad areas within the cities.

(5) The development of the railway and terminal areas so that the relations and operations between them may be carried on with maximum efficiency and minimum cost.

(6) The segregation and control of industrial areas requiring railway accommodation.

(7) The placing of the passenger terminals as close as possible to the community and transportation centre.

(8) The placing of the centres for receiving and distributing the different classes of freight as close as possible to the origin and destination of the business.

(9) The locating of centres of railway business in places which have adequate avenues of access and ample traffic spaces around them.

(10) The development of the plan for improvement and expansion to be laid out in such a manner that it can be executed progressively and at a minimum cost.

(11) The development to be planned for the harmonization and proper co-ordination of rail and water transportation.

(12) Consideration of future growth of traffic.

(13) The use of as many of the existing lines in the proposed plan as possible, compatible with the foregoing, so as to obtain economy of execution.

Minor considerations which have a bearing on the solution of the problem are as follows:

(1) The directions of growth of the business, industrial, warehouse, and residential districts of the city as a whole.

(2) Present and probable future value of real estate.

(3) Local cost of handling and teaming freight.

The briefest survey of these considerations makes it immediately apparent that the harmonizing of all of them and of all the different interests involved, both those of the city and of the numerous railway companies, can be brought about only after a period of patient discussion and study. Co-operation between the administrative authorities and the railways will be necessary. Joint use of tracks and facilities, and the admission by one company of another to locations which have always been considered competitively advantageous, will also be necessary.

Economic Relations of Cities and Railways

The economic relation between a city and its transportation facilities is so close that the growth and development of the one depends upon the growth and development of the other. From earliest times, the growth of cities has been governed by some form of transportation.

In city-planning, we are interested primarily in the effect of this relation between the city and railway transportation on the life and growth of the city itself.

Cause of Existing Conditions

The strong rivalry between cities to obtain the construction of railways has always been a factor, in attracting the roads, equal to the desire of the railways to reach centres of distribution. The advent of a railway to a city which became the terminus of the line for the time being definitely established that city as a trade centre. There was bidding on the part of cities for railway favor, with the result that a railway could get almost any concession asked for.

No blame can be attached to either of the principals in the transactions. The cities were small and anxious to thrive. The railways were in a precarious business, and often it was essential to their construction that they should obtain bonuses or grants from the Federal Government, from the Province,

or from the cities or towns. It was not to be expected that men would look ahead fifty or seventy-five years to see whether or not a certain location would hurt the city at a time far in the future. The cities needed the railways and took the line of least resistance to obtain them. So we find areas, occupied by railways, in what has become the most valuable business districts of a city. When these areas were acquired for freight and passenger terminals, they were on the outskirts of the city or town as it then existed.

The experience which time has provided, of the effect of railway locations on the development of the city, was then lacking. The city could not know, when perpetual franchises were granted, and streets through railway property were closed under by-laws, that the time would come when undesirable conditions would result from such franchises and such vacations. The lines naturally built terminals at points most advantageous from the point of view of railway operation. There was no control or direction by the city looking to the future. And as the city grew and the railway expanded and asked further franchises and more locations, they were still more or less successful in obtaining them.

With the railway lines firmly established and no means provided for re-locating and unifying them, it was logical for the city to grow around and between them. The railway lines, in a large measure, fixed and established definitely the development of the city. The railways have largely determined the areas in use for industrial purposes and, to a certain extent, the areas to be used for business purposes, leaving the residential areas to be more or less indiscriminately scattered.

The railway lines were able to penetrate a city from almost every direction. Along these lines, industries, warehouses and local distributing centres have been established. Instead of a logical division of railway and industrial areas and of residential areas, industries have been scattered indiscriminately and have detrimentally affected in their immediate neighbourhood a much larger area than they themselves occupy. Tenement areas have grown up between the arms of the railways, close to the centre or heart of the city, where property values are high and it is necessary to crowd the population in order to secure adequate returns.

Again, when railways were first constructed, their resources were not always great in the city, the vehicular and pedestrian traffic was light, and the necessity was not felt to compel the railways to enter the city except by the easiest way possible, which was generally at the grade of the surrounding country or of the city itself. Consequently grade separation of highway crossings was rare.

Absence of experience, foresight and control led to the lack of provisions

for the opening of streets. It led to the use of then unimportant streets by railway companies, to the placing of yards within the city, close to the central development, and to the closing of streets where they interfered with yard and track lay-outs.

As time went on, the efforts of the city to grow into areas outside and beyond the railway lines were blocked by this lack of street communication. The railways, when they had closed up streets, were reluctant to allow of re-opening them across their property. When leave was granted, it was usually at the expense of the municipality. Where streets existed at grade crossings, the railways were usually reluctant to provide subways or bridges. Passage across grade crossings was dangerous and often inconvenient, and consequently the city grew in directions where there was the minimum of obstruction of this kind.

Present Situation in Ottawa and Hull

The lines centreing in Ottawa and Hull group themselves into four natural divisions,—east, south, west and north. Those which form the group on the east are the Canadian Pacific Short line, the Canadian Northern, the Grand Trunk and the Ottawa and New York. The group on the south is composed of the Canadian Northern Toronto line and the Canadian Pacific Prescott line; that on the west, of the Canadian Pacific and the Canadian Northern trans-continental lines and the Grand Trunk Depot Harbor line; that on the north, of the Waltham, Maniwaki and North Shore lines of the Canadian Pacific. See Drawing No. 12.

These four groups each have a separate focus. The group on the east focuses, generally speaking, at a point about a mile and one-half to the east of the Rideau River; that on the south at Chaudiere Junction, one mile south of the Rideau River; that on the west, at a point about two miles west of Britannia; that on the north in Hull. Each of these foci, with the exception of the one on the north, is at least three miles from the centre of Ottawa and Hull.

Of these four foci, three are of major importance, those on the east, north and west. The east and west foci lie on what may be called the axis of movement through Ottawa and Hull. This axis lies along a line approximately parallel with the Ottawa River. Nearly all the passenger business of the cities, all the freight to and from the west, and a large part of the freight to and from the east at present move in this direction.

The focus on the north, in Hull, has its importance on account of the fact that the Canadian Pacific Railroad operates most of its freight to and from the east over the North Shore line, and while this line is parallel with the

general axis of movement, it enters the Ottawa-Hull centre at a point inconvenient for co-ordination into the eastern focus.

The minor focus on the south is really only the joining of a branch line of the Canadian Pacific with the Canadian Northern west-bound line.

Multiplicity of Lines and their Effects

The several main railway entrances into Ottawa, and the minor lines, giving means of access to special localities, have cut the city up into many parts. They have the effect of placing, by their presence, and by the presence of the yards and industrial development which they induce, strong barriers between the divisions. See Diagram, page 33.

Spreading of Industry

This multiplicity of entrances and minor connecting lines has had the effect of indiscriminately spreading industrial works throughout the city.

On the east of the city, a continuation of industrial development along the Sussex Street line will have the effect of placing between the city and the large residential area on the hills of Rockcliffe, and between the Government Centre and Rideau Hall, a barrier wider than is caused by the Rideau River. It will render the use of the property between the railway and the river unsuitable for anything but industrial development with its consequent effects, which is a condition not to be desired in this vicinity.

Industrial development along the cross-town line uses areas in the centre of a good residential district. This industry and lumber storage development affects the residential value of considerable property on either side. For instance, in the area west of Bronson Avenue and between the cross-town line and Dow's Lake, the quality of the residential development is inferior. It might have been expected that the presence of Dow's Lake and the Experimental Farm would bring into this district a good character of development. The presence, however, of lumber yards and of tracks traversing this area has lowered its value for residence. It is generally the case that it is the poorer people who are forced to live in these abandoned areas.

Street Conditions—Ottawa

To the west of the city, both within and outside of the limits, where much of the more recent subdividing has been carried out, but few of the streets cross the railway tracks. On the Grand Trunk cross-town line between Bronson Avenue and the Rideau Canal, a distance of about one mile, only three streets cross the tracks. See Diagram, page 33, and Drawing, No. 10.

To the east of the city beyond the limits, the presence of main railway

lines is resulting in the incomplete provision of through streets, and special attention is called to the lack of street crossing on the Sussex Street line.

On the Prescott line, there is only one street crossing the tracks between Carling Avenue and Somerset Street, a distance of nearly a mile.

Hull

The line connecting the Alexandra Bridge with the North Shore line has closed some of the streets, and the effect of the line itself on the street system is very apparent.

The two lines past the cement plant have themselves had little effect on the city, since the area between them is occupied by the cement industry. Streets are necessary across this area.

Opening of Streets Across Railway Property

In cases where a railway company builds its line into a city, across a district, of which the subdivision was neither laid out nor recorded, new streets, connecting those on one side with those on the other, can only be opened across the railway right-of-way by an order of the Dominion Board of Railway Commissioners. This applies to areas now within the city, which, when the road was built, were outside and later incorporated. The effect of no provision, in the past agreements between the city and the railway companies at the time rights-of-way and street closings were granted, for new streets as the city expanded, is very apparent both in Ottawa and Hull.

Grade Separation

The cost of separating the grade of the tracks from that of the streets would be reduced if there were fewer rights-of-way. It is hard to imagine that the city will be satisfied to allow present conditions to be maintained for any long period of time, and that, when separation takes place, they will be satisfied with the present incomplete street development. The large cost of this to the railway companies will lie in the fact that where each company has its own entrance from one direction, it will have to bear the cost of separating this entrance from the grade of the streets. For instance, west of the city, the Grand Trunk parallels the Canadian Pacific a short distance away, and will have to separate the grades of practically the same streets as does the Canadian Pacific. This will involve duplication in expenditure. If the lines can be unified, it is evident that this cost can be reduced.

Another evil result of the multiplicity of railway lines or rights-of-way within the city lies in the crossing of one railway by another at grade. This leads to expense for the railway companies in the maintenance of interlocked crossings and eventually in grade separation.

The same may be said to be true of electrification, which will no doubt eventually be required in all large terminal centres. It has always been

one of the main arguments of the railway companies to cities where electrification has been proposed, that the numerous rights-of-way render it extremely expensive, and that before electrification could be carried out a unification of the lines would be necessary.

Another evil effect of the multiplicity of lines within the cities lies in the fact that much area is needlessly occupied by "Y's" and track connections. It can readily be seen that the carrying of streets across these areas will be hard to bring about and very expensive. Either long, dark, expensive subways, or high, inconvenient viaducts will be required.

An example of this is shown at the "Y" connection between the Prescott line of the C.P.R. and the Broad Street station. While viaducts have been provided across the railway area at this point, this has resulted in the taking of a very wide piece of property for railway purposes. The relation of the elevations of the tracks to those of the adjacent area has necessitated long ramps to the viaducts. These have had the effect of dead ending and seriously affecting a large amount of property on each side of the railway.

Requirements for Expansion

The interest of each railway company in making provision for future increase in traffic has led in many cases to their acquiring much more property than is necessary to do their business. Competition and the resultant absence of co-operative relations between the roads have been largely responsible for this and for the investment of unnecessary money. Much area held by railroad companies has practically lain idle for many years awaiting development. The lack of development and the uncertainty concerning its future use have acted to retard proper development of adjoining territory. Unless there is concentration of facilities into a general area, the consequent effect on the city is undesirable.

While Ottawa, on account of its topographical features, is fortunate in having most of its railway property situated in districts which are naturally fitted for such occupancy, there has been, nevertheless, acquisition by the companies of considerably more area than is necessary for some time to come, if there be carried out some re-arrangement and concentration of facilities.

Present Railway Areas and Terminals

In the city of Ottawa itself have been developed two main railroad areas, —one on the east and one on the west of the city. These two general areas, "A" and "B," on diagram, page 73, are naturally fitted for use for railway purposes.

The area in the eastern district extends from the Rideau River to the canal and along the edge of the canal as far as Rideau Street. This general area, adjacent and parallel to the canal, which itself has been a natural

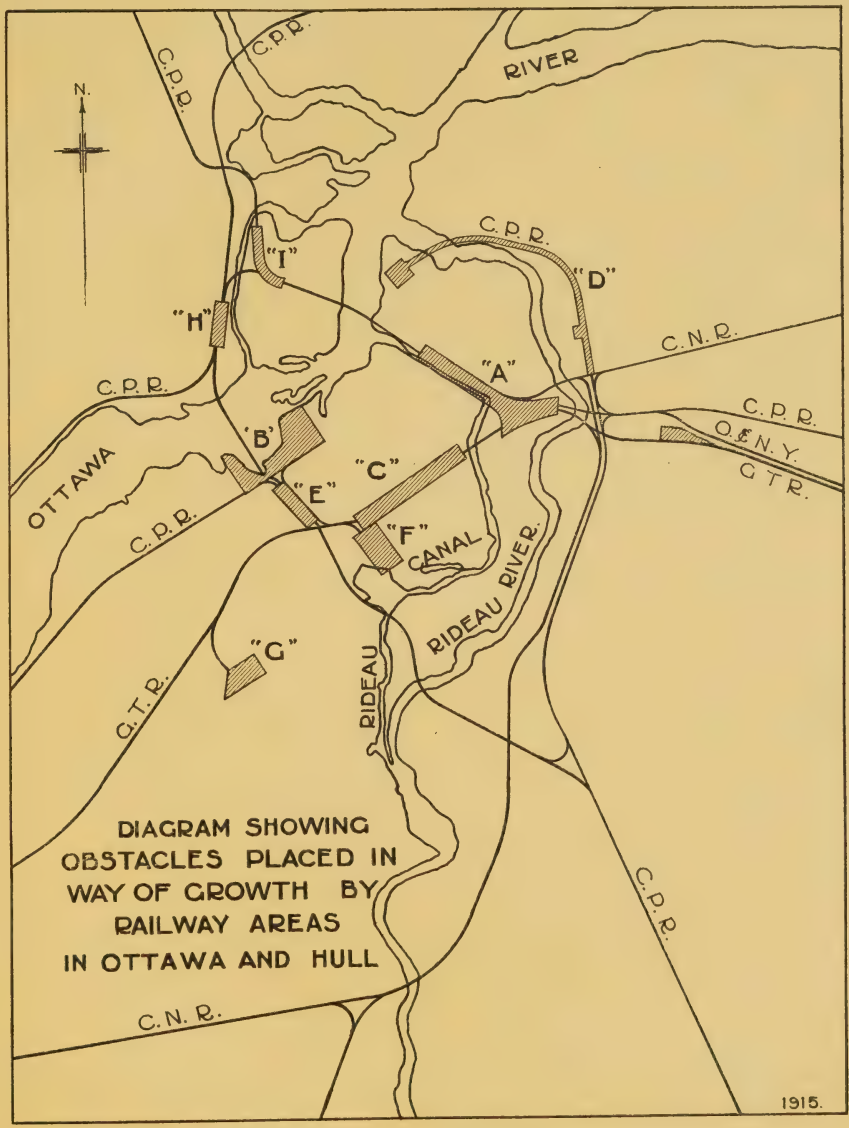


DIAGRAM SHOWING OBSTACLES PLACED IN WAY OF GROWTH BY RAILWAY AREAS IN OTTAWA AND HULL

barrier to physical development of the city, has not created by its presence more than a slightly wider barrier than would otherwise have existed. Part of this area was for a long time a swamp and would probably have remained vacant but for occupancy for this purpose.

The other general railway area, the one to the west of the city, lies west of Broad Street between Wellington Street and the Ottawa River. This area is low lying, and for the most part below the general level of the city. Furthermore, it offers no obstruction to the development of the city westward.

Other railway areas and spurs, extending from these large main areas, have developed at different points around the city. The former are due partly to individual routes of access, and to property holdings by the early railways when the city was young, and the latter to connections entering the general railway areas "A" and "B." These isolated areas and spurs have affected the character of the growth and the opening of streets, in the districts in which they are situated.

The area, ("C" on diagram, page 73), stretching along the cross-town line has had the effect of blocking the growth of the city southwards and of closing up the streets. The yards situated there have also been a menace to the adjacent property.

The Sussex Street area of the Canadian Pacific, ("D" on diagram, page 73), is so situated that it places an unsightly obstacle in the path of traffic and growth towards Rockcliffe and Rideau Hall.

The area adjacent to Broad Street, ("E" on diagram, page 73), occupied by the Canadian Pacific Prescott branch and the Grand Trunk Chaudiere branch has extended the railway area up across the westward expansion of the city.

The lumber yards, ("F" on diagram, page 73), situated at the west end of the cross-town line near Bronson Avenue, have the same general effect as the isolated railway areas.

In Hull, the line of the Canadian Pacific, from their bridge on the west of the city to the Gatineau River, causes a barrier to the expansion of the city westward. The topographical conditions immediately to the west of this line, however, and the undesirability of bringing the line closer into the city renders a change of location difficult.

Analysis of Present Facilities.

A study of the facilities of the different railways indicates the following:

(1) That the Grand Trunk Station, as it now stands, has room for nearly twice the number of trains at present operated into and

out of the whole of Ottawa and Hull. This station is situated at the centre of distribution of the transportation system of the cities, and at the centre of the district in which is concentrated the greatest number of activities—governmental, business and hotel. The present situation of the Grand Trunk Station is admirably situated with respect to the street arrangement and arteries of travel.

(2) That the Canadian Pacific station is far removed from the activity centre of Ottawa. On account of its location and the arrangement of the lines of approach, it is not a desirable site for a union station.

(3) That the L.C.L. (less than carload) freight facilities, both of the Canadian Pacific and of the Grand Trunk, are little more than sufficient to handle the present business of the city. This is true also of the Ottawa and New York and the Canadian Northern Railway.

(4) That team track facilities in the city are, at present, at least 40% or 50% in excess of the requirements.

(5) That the classification yards of the Grand Trunk on the cross-town line and of the Canadian Pacific in the Broad Street area are not much in excess of the requirements of these roads.

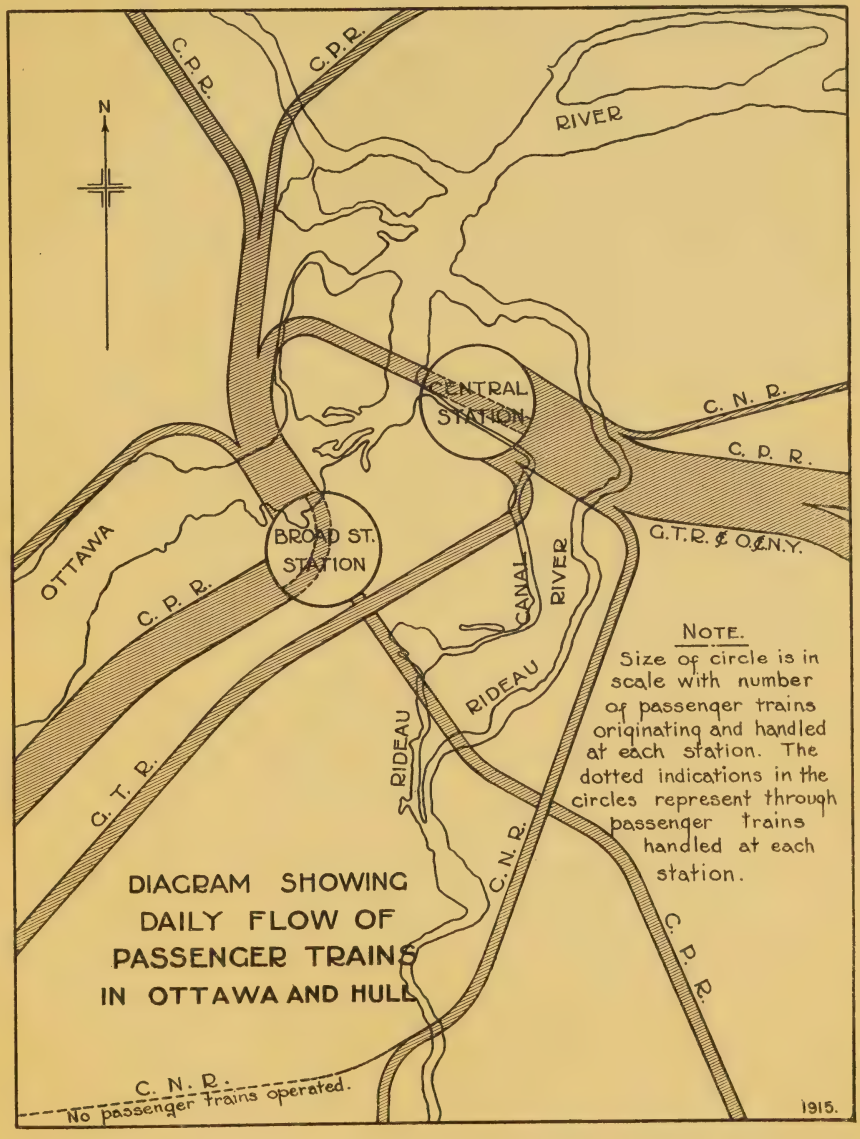
(6) That the Canadian Northern has carried out little of its projected terminal improvement.

It will be necessary for the roads involved to consider in the near future the enlargement or rebuilding of various facilities. In working out any plans, these should be drawn with relation to the ultimate development of the terminal situation of the cities.

Analysis of Present Traffic

Of the trains entering Ottawa and Hull at present, 40% are from and to the east, 49% are from and to the west, and 11% are from and to the north through Hull. These figures will vary slightly depending upon seasonable traffic. Of the total number of trains coming into the city, 10% are through trains. The percentage of passenger business to and from the east is 41%; from and to the west 42%, and from and to the north 17%, of the total. All these figures are based on counts taken. See Diagram, page 77.

Analysis of the freight shows that 44% of the freight which comes into the city is for local delivery by the carrying road; 34% is through freight on the carrying road and 22% is interchange. Of this through freight, two-thirds is from the west and one-third is from the east. See Diagram, page 79.


C.P.R.
C.P.R.
RIVER
N
CENTRAL STATION
C. N. R.
C. P. R.
G.T.R. & O.C.N.Y.
BROAD ST. STATION
OTTAWA
C. P. R.
CANAL
RIVER
RIDEAU
RIDEAU
G. T. R.
C.N.R.
C. P. R.
NOTE.
Size of circle is in scale with number of passenger trains originating and handled at each station. The dotted indications in the circles represent through passenger trains handled at each station.
DIAGRAM SHOWING DAILY FLOW OF PASSENGER TRAINS IN OTTAWA AND HULL
C. N. R.
No passenger trains operated.
1915.

STATEMENT OF RAILWAY FREIGHT
HANDLED IN OTTAWA AND HULL

OTTAWA

CLASS	TOTAL				TO AND FROM								① ORIGIN								② DISTRIBUTED								③ THROUGH FREIGHT							
					EAST				WEST				EAST SECTION OF CITY				WEST SECTION OF CITY				EAST SECTION OF CITY				WEST SECTION OF CITY				WEST BOUND				EAST BOUND			
	TONS.	% of TOTAL	CARS	% of TOTAL	TONS	% of CLASS	CARS	% of CLASS	TONS	% of CLASS	CARS	% of CLASS	TONS	% of CLASS	CARS	% of CLASS	TONS	% of CLASS	CARS	% of CLASS	TONS	% of CLASS	CARS	% of CLASS	TONS	% of CLASS	CARS	% of CLASS	TONS	% of CLASS	CARS	% of CLASS	TONS	% of CLASS	CARS	% of CLASS
TOTAL FREIGHT IN AND OUT OF CITY.	7034	100.0	411	100.0																																
TOTAL THROUGH FREIGHT	3787	53.8	172	41.9																									1267	33.5	70	40.7	2520	66.5	102	59.3
TOTAL LOCAL FREIGHT.	3247	46.2	239	58.1	2480	76.4	155	64.8	767	23.6	84	35.2	770	23.7	40	16.7	770	23.7	65	27.2	913	28.1	73	30.5	794	24.5	61	25.6								
PACKAGE FREIGHT.	326	4.4 *10.0	110	23.7 *46.0	239	73.3	62	56.4	87	26.7	48	43.6	88	27.0	21	19.1	62	19.0	30	27.3	99	30.4	31	28.2	77	23.6	28	25.4								
TEAM TRACK FREIGHT	2376	31.7 *73.2	103	24.0 *43.1	1824	76.8	73	70.9	552	23.2	30	29.1	661	27.8	18	17.5	415	17.5	21	20.4	729	30.7	39	37.9	571	24.0	25	24.2								
INDUSTRY FREIGHT.	545	7.3 *16.8	26	6.0 *10.9	417	76.5	20	76.9	128	23.5	6	23.1	20	3.7	1	3.8	294	53.9	14	53.8	85	15.6	4	15.4	146	26.8	7	27.0								

HULL

TOTAL LOCAL FREIGHT	1084	100.0	50	100.0	503	46.4	22	44.0	581	53.6	28	56.0	756	69.7	35	70.0					328	30.3	15	30.0												
PACKAGE FREIGHT	15	1.2 * 1.2	4	7.7 * 8.0	8	61.5	2	50.0	5	38.5	2	50.0	5	38.5	2	50.0					8	61.5	2	50.0												
TEAM TRACK FREIGHT	180	16.3 *16.6	10	19.1 *20.0	104	57.8	5	50.0	76	42.2	5	50.0	37	20.6	2	20.0					143	79.4	8	80.0												
INDUSTRY FREIGHT	891	80.5 *82.2	36	69.3 *72.0	391	43.9	15	41.7	500	56.1	21	58.3	714	80.2	31	86.1					177	19.8	5	13.9												

Note

In addition to the above there are about 60 cars switched locally each day

① This column refers to outbound freight

② This column refers to inbound freight.

③ This column shows direction of through freight

Interchange freight appears in local and through freight

* Indicates percentage of local freight.

Figures shown are for daily business.

1915.

Of the freight which comes into or originates in the city, two-thirds is in and out to the east and one-third is in and out to the west.

Splitting this local freight up into its elements of L.C.L., team track and industrial, we find:

(1) That the centre of gravity for the L.C.L. freight is in the block bounded by Metcalfe, O'Connor, Slater and Albert Streets.

(2) That this freight is about equally distributed between in and out, and is handled about equally in the east and west areas.

(3) That 73% of the L.C.L. is to and from the east and 27% is to and from the west. These figures are for tons. For cars, the figures are 56% east and 44% west.

(4) That of the total team track tonnage, 77% is to and from the east and 23% is to and from the west. These figures are approximately true for cars also.

Note: It has been impossible to find a centre of gravity for distribution of team track business within the city. It is found, however, that 59% of this business is handled on the east side of the city, and 41% is handled on the west side of the city. This applies approximately to the cars also.

(5) That of the industry business, 77% is to and from the east and 23% is to and from the west, and that 19% originates and is distributed in the eastern area and 81% in the western area.

(6) That of the whole of the Hull business, 46% is to and from the east, and 54% is to and from the west. Hull is operated as a way station.

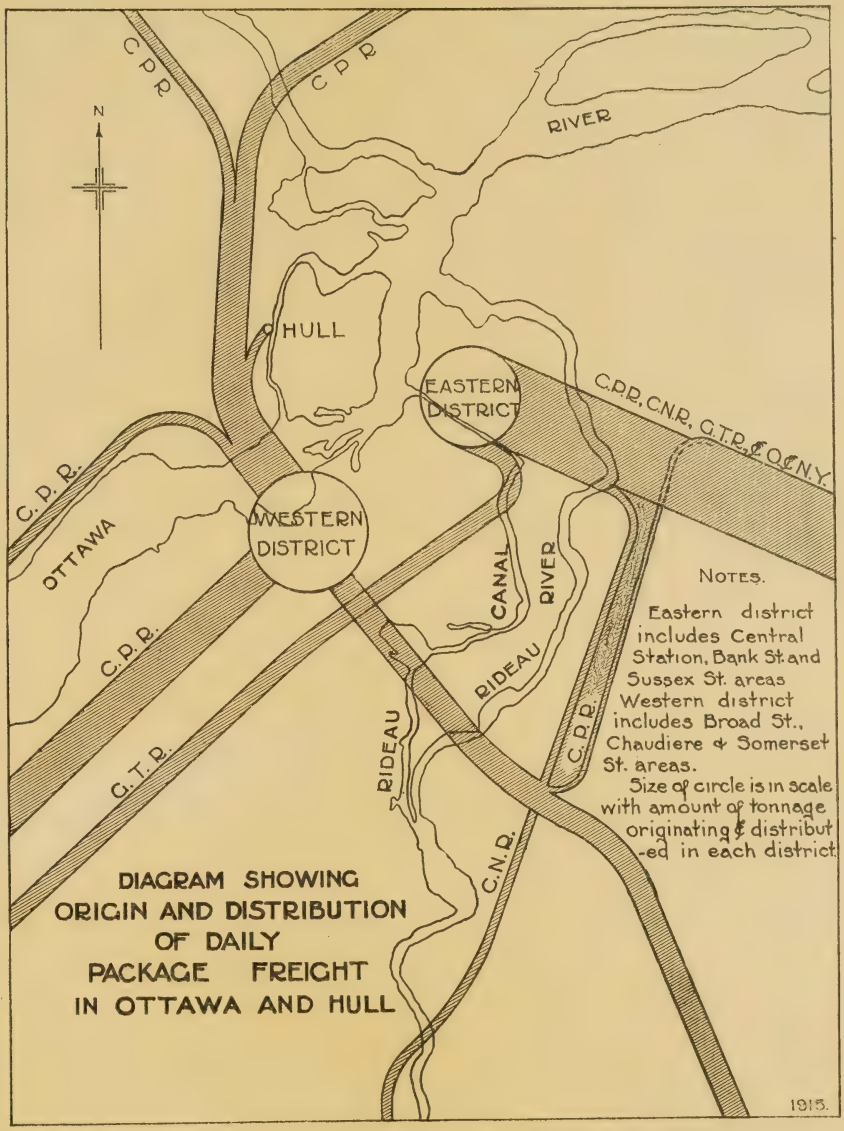
See Diagrams, pages 83, 85 and 87.

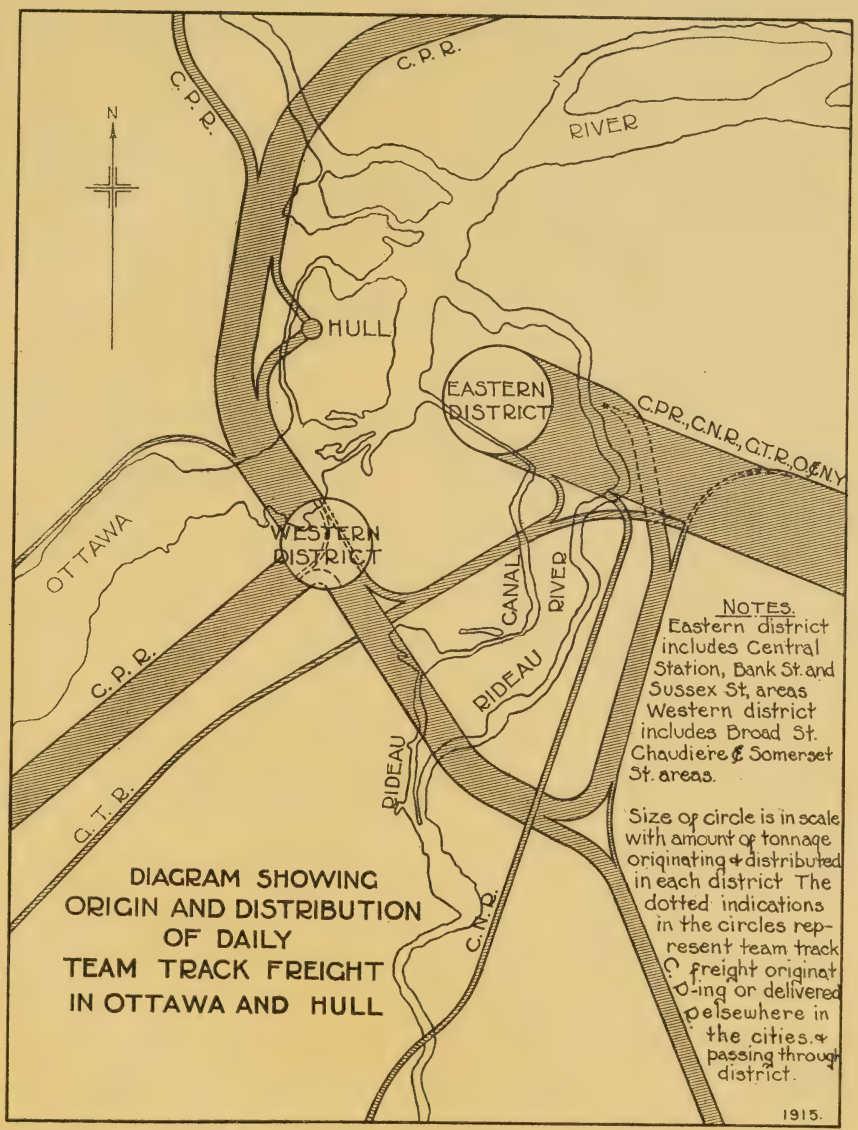
Present Operation

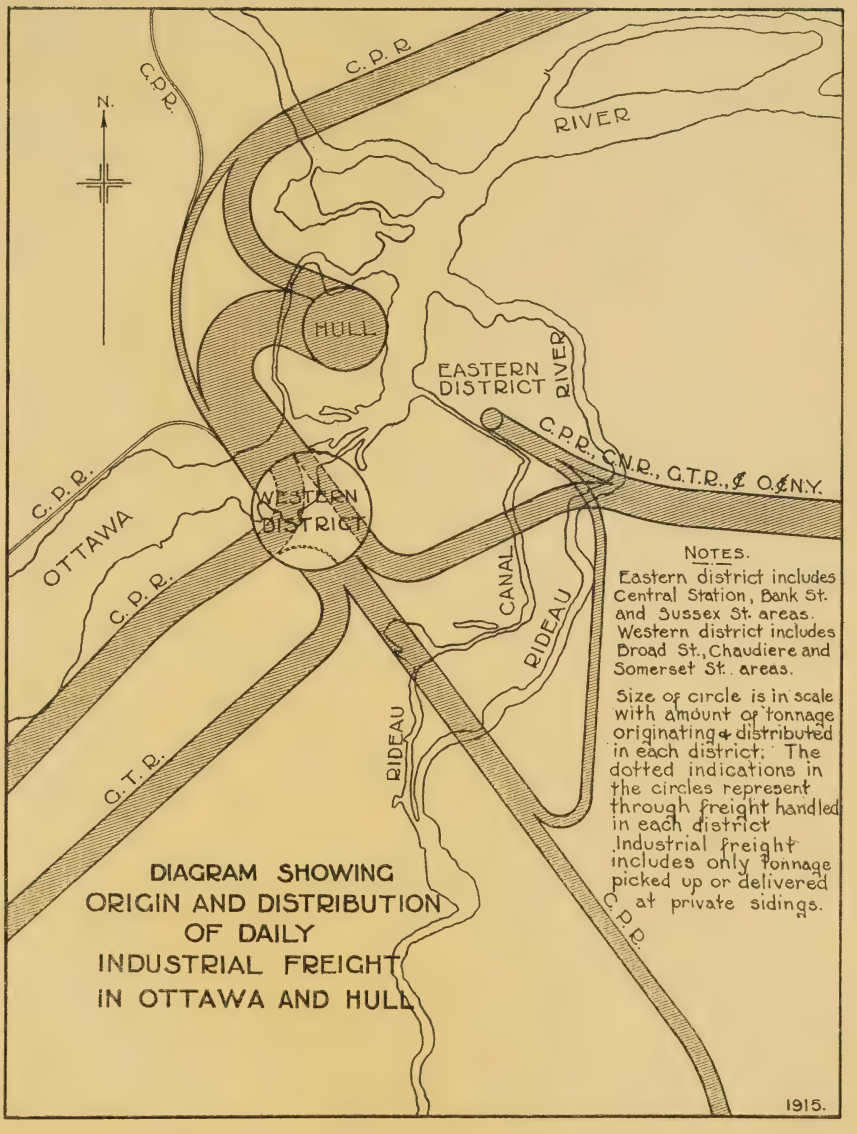
For the sake of brevity it is not considered advisable to go into minute analysis of the operating conditions of the railways of the city. There are, however, some features which merit consideration in any scheme of re-arrangement. It is a matter of common knowledge that through passenger trains over the Canadian Pacific are detoured through Hull in order to proceed on their journey. These trains consume twenty-five minutes in passing between the Central and Broad Street Station.

Through passenger trains on the Canadian Northern or on the Grand Trunk have the inconvenience, under the present arrangement, of a back-up-movement in order to proceed on their journey after having delivered their passengers at the Grand Trunk Central Station, which they both use.

There is little question but that the Canadian Pacific is inconvenienced


C.P.R.
C.P.R.
RIVER
N
HULL
EASTERN DISTRICT
C.P.R. C.N.R. G.T.R. & O.C.N.Y.
C.P.R.
OTTAWA
WESTERN DISTRICT
CANAL
RIVER
C.P.R.
RIDEAU
RIDEAU
C.P.R.
G.T.R.
C.N.R.
Notes.
Eastern district includes Central Station, Bank St. and Sussex St. areas
Western district includes Broad St., Chaudiere & Somerset St. areas.
Size of circle is in scale with amount of tonnage originating & distributed in each district
DIAGRAM SHOWING ORIGIN AND DISTRIBUTION OF DAILY PACKAGE FREIGHT IN OTTAWA AND HULL
1915.


C.P.R.
C.P.R.
RIVER
N
HULL
EASTERN DISTRICT
C.P.R., C.N.R., G.T.R., O&NY
WESTERN DISTRICT
OTTAWA
C.P.R.
CANAL
RIVER
RIDEAU
RIDEAU
G.T.R.
C.N.R.
DIAGRAM SHOWING ORIGIN AND DISTRIBUTION OF DAILY TEAM TRACK FREIGHT IN OTTAWA AND HULL
NOTES.
Eastern district includes Central Station, Bank St. and Sussex St. areas
Western district includes Broad St. Chaudiere & Somerset St. areas.
Size of circle is in scale with amount of tonnage originating & distributed in each district The dotted indications in the circles represent team track freight originating or delivered elsewhere in the cities & passing through district.
1915.


N.
C.P.R.
C.P.R.
RIVER
HULL
EASTERN DISTRICT
RIVER
C.P.R., C.N.R., G.T.R., & O.&N.Y.
C.P.R.
OTTAWA
WESTERN DISTRICT
C.P.R.
CANAL
RIDEAU
RIDEAU
G.T.R.
C.P.R.
NOTES.
Eastern district includes Central Station, Bank St. and Sussex St. areas.
Western district includes Broad St., Chaudiere and Somerset St. areas.
Size of circle is in scale with amount of tonnage originating & distributed in each district. The dotted indications in the circles represent through freight handled in each district.
Industrial freight includes only tonnage picked up or delivered at private sidings.
DIAGRAM SHOWING
ORIGIN AND DISTRIBUTION
OF DAILY
INDUSTRIAL FREIGHT
IN OTTAWA AND HULL
1915.

and put to extra expense by the maintenance of one terminal and the rental of a portion of another. The present practice by this road of turning their trains before they enter the Broad Street station is an inconvenience to the passengers.

The operation of freight traffic across the throat of the Broad Street station is an inconvenience and a danger to the passenger travel. Little improvement can be made in the operation of the whole Broad Street area, without an almost complete re-arrangement of both passenger and freight facilities.

The Canadian Pacific Railroad is burdened with considerable expenditure, in their endeavours to reach the eastern district, at the Sussex Street yard. A long switching haul of about ten miles from the classification yard is undertaken to reach this area.

Analysis of the present methods of exchanging freight cars shows that they are inadequate. Interchange from the Canadian Northern and the Ottawa & New York to the Grand Trunk is handled by the Canadian Pacific and takes place at Somerset Street near Bronson Avenue. These interchange cars are taken all the way round to Chaudiere Junction from the east, before being handed over to the Grand Trunk. They are then hauled back to the Bank Street yard for sorting. This involves unnecessary mileage, inasmuch as the Grand Trunk is close to both the Ottawa & New York and the Canadian Northern near the Rideau River.

There is much duplication of engine mileage and consequently of expense in operation on account of yards being operated independently by different companies in one area,—for instance, in the Broad Street district.

There is much intermingling of freight and passenger movements at present. This condition will become more aggravated and lead to delay and expense as traffic increases.

Growth of Traffic.

Such measure as can be had of the growth of freight traffic is, at best, a general one over a whole country or territory. Generally speaking, freight traffic has doubled about every ten or eleven years, and passenger traffic has doubled about every thirteen or fourteen years. Taking the growth of Canadian business, and of Ontario business as indicated by the growth of the traffic on the Grand Trunk, which has in the past been largely confined to that province, this relation is about the same. Taking the United States, both over the whole country and over the classification districts of the Interstate Commerce Commission, it is found that the relation is about the same.

A study of passenger growth, in its relation to population, shows that during the last thirty years, there has been a tendency towards a constant

number of people for every daily trip taken. At the present time, in the United States, there is one passenger carried per day for every twenty-seven of the population. In Canada, the number of people per daily trip is fifty-eight. The same characteristic is found in freight business,—the tendency towards a constant number of people for every ton of freight per day. At present, the figure in the United States is about one ton of freight per day for sixteen of the population. In Canada, the latter figure is about twenty-seven. See Diagrams, pages 91, 93 and 95.

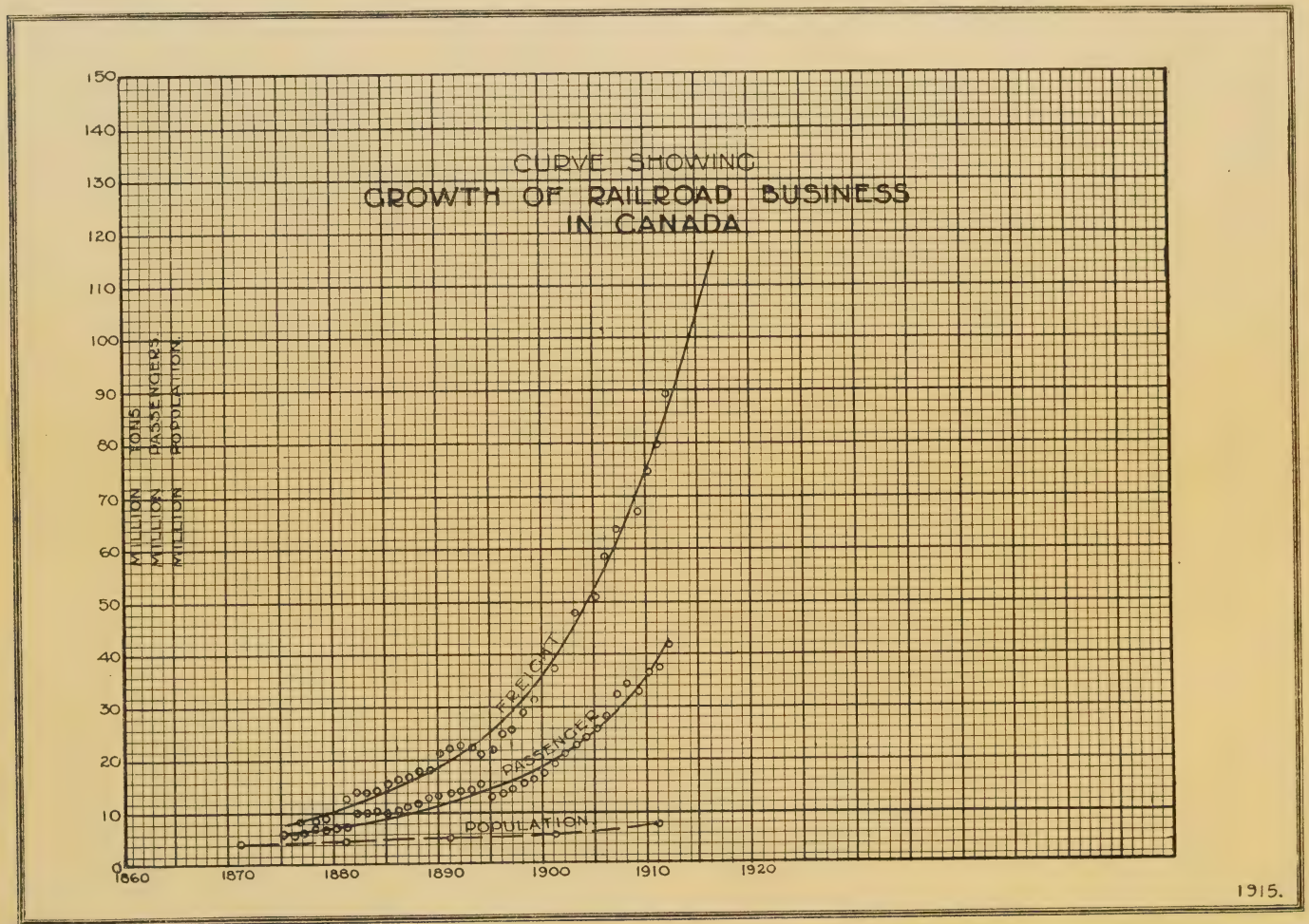
In the matter of passenger business, Ottawa stands high compared with the country as a whole. There is one daily passenger for every twenty-two of the population. In Washington, the figure is one passenger for every twenty-three of the population during times of normal travel, and one passenger for every eight of the population at a time of maximum travel, for instance, that of a Presidential Inauguration.

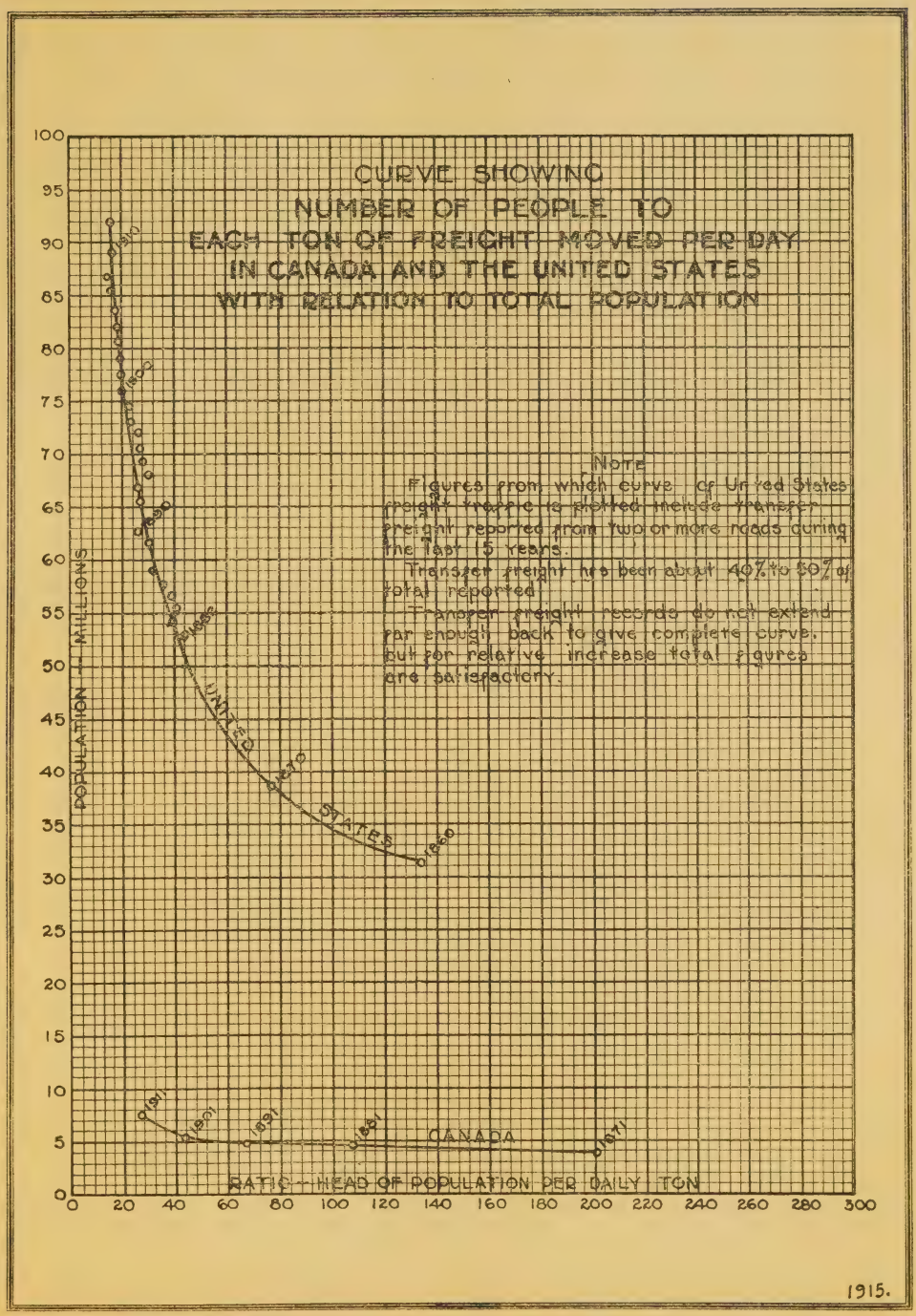
In local freight, including package, team and industrial freight, the figure for Ottawa, is one ton per day for every thirty people. In Chicago, the figure is one ton for every nine people, and in Boston the figure is about one ton for every twenty-five people.

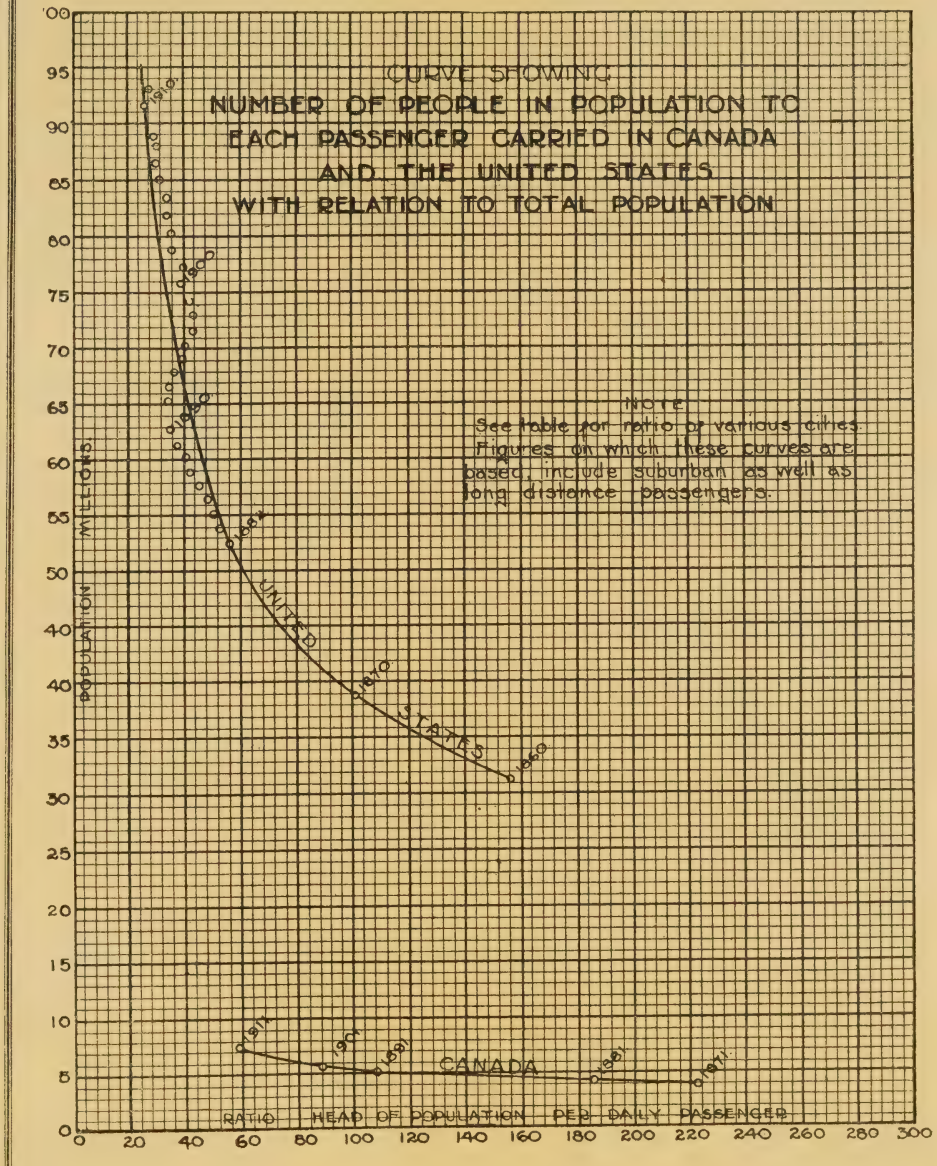
Application of the past rate of growth, as outlined in the first paragraph, to determine a future volume of business for Ottawa, would indicate that, in forty years, the Ottawa freight business would be sixteen times as great as it is to-day, and the passenger business would be about ten or twelve times as great as it is to-day.

It has been estimated that the population of Ottawa and Hull, thirty-five or forty years hence, will be about two hundred and fifty thousand people. This is an increase of two and one-half times the population of the present day, and an estimate from the above would show that, when the population has increased two and one-half times over what it is to-day, the freight business will have increased to sixteen times what it is to-day, or six or seven times as fast as the population. The passenger business will have increased to about ten times what it is to-day, or between four and five times as fast as the population.

The consumption of one ton per day for every thirty people, therefore, will have grown to one ton for every four or five people, and the normal passenger business, from one daily passenger to every twenty-two people, will have increased to one trip for every six or seven people. It will be seen that this figure for freight is greater than the present consumption of the freight business in Chicago, one of the largest trading and industrial centres in the world. Ottawa is likely, in the matter of passenger business, to have a consumption far above that which is normal in other cities on account of its being a government city.


CURVE SHOWING
GROWTH OF RAILROAD BUSINESS
IN CANADA
MILLION TONS FREIGHT
MILLION PASSENGERS
MILLION POPULATION
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
1860
1870
1880
1890
1900
1910
1920
FREIGHT
PASSENGER
POPULATION
1915.


CURVE SHOWING
NUMBER OF PEOPLE TO
EACH TON OF FREIGHT MOVED PER DAY
IN CANADA AND THE UNITED STATES
WITH RELATION TO TOTAL POPULATION
NOTE
Figures from which curve of United States freight traffic is plotted include transfer freight reported from two or more roads during the last 15 years.
Transfer freight has been about 40% to 50% of total reported.
Transfer freight records do not extend far enough back to give complete curve, but for relative increase total figures are satisfactory.
POPULATION IN MILLIONS
RATIO — HEAD OF POPULATION PER DAILY TON
UNITED STATES
CANADA
1830
1840
1850
1860
1870
1880
1890
1900
1910
1891
1901
1911
1915.


CURVE SHOWING
NUMBER OF PEOPLE IN POPULATION TO
EACH PASSENGER CARRIED IN CANADA
AND THE UNITED STATES
WITH RELATION TO TOTAL POPULATION
NOTE
See table for ratio of various cities.
Figures on which these curves are
based, include suburban as well as
long distance passengers.
POPULATION MILLIONS
RATIO HEAD OF POPULATION PER DAILY PASSENGER
1910
1900
1890
1880
1870
1860
UNITED STATES
1915
1910
1905
1900
1895
CANADA
1890
1885
1880
1875
0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

1915.

Probable Volume of Future Traffic

The railway business of a community is determined by the capacity of the individual to consume, produce or distribute goods. In the first of these, the purchasing power of the individual has a limit. In the second, the productive power of the individual has a limit, even although it is probable that a large increase in the mechanical means of production per head of population will undoubtedly continue to be made. In the third, Ottawa is not a distributing centre in the general sense of that word.

A moderate increase in the future railway business of Ottawa is more probable than an increase based on past growth, and this has been the basis of estimates made to determine the facilities which will be necessary thirty or forty years hence. It has been assumed that Ottawa's railway business will increase twice as fast as the population, and that, when the population is two hundred and fifty thousand, Ottawa's railway business will have increased five or six times over the present. This will have reduced the number of people per daily ton of freight to about fifteen and the number of people per daily passenger of normal travel to about thirteen.

RECOMMENDATIONS

On the basis of the analysis made, the following are recommended:

(1) The placing of the Federal District Commission in complete control of the railway situation within the limits of the district.

(2) The adoption of the general plan recommended, having in view the concentration and simplification of the railway situation.

(3) The acquisition and control by purchase or agreement, or both, of all existing trackage and terminal properties within the limits of the district.

(4) Terminal operation and control.

(5) Electrification of the unified system.

Plan for Development

The general problem of the railways in Ottawa and Hull, on the basis of this analysis, becomes that of using in Ottawa the main areas (A and B on diagram, page 71), described as best fitted for railway uses, and the connecting of these areas with the foci in the shortest and most economical manner possible. Various plans have been investigated and compared, and have been reduced to the one which is considered to have the most practicable and most economical features. Many of the plans which have been studied have been fundamentally but variations of the plan presented. None of the alternative plans, however, has the same compactness of arrangement and simplicity of operation.

The plan presented and recommended for adoption is shown on Drawings Nos. 11, 12, 13 and 26. It consists basically of the construction of a tunnel from the Grand Trunk Station to Broad Street. This tunnel, connected with the east focal point by the Grand Trunk, and with the west focal point by the Canadian Pacific main line to Carleton Place, will form the trunk line through Ottawa. This trunk line passes through the two areas described as especially fitted for railway uses.

Union Passenger Station, Ottawa

The Grand Trunk station slightly remodelled will remain in its present location, and will serve as the Union Station for all roads. A local passenger station will be placed a short distance to the west of Broad Street to serve the western section of the city.

Since most of the passenger movement is through the east and west focal points, this trunk line will satisfy the passenger movement in a splendid manner. The west bound Toronto trains of the Canadian Northern, which are through trains, will be faced, however, with an inconvenient back-up movement in passing from this passenger station to the Toronto line. Furthermore, they will not pass through the local station to the west of the city. To meet this it is proposed to construct a five mile connection, shown on Drawing No. 12, from a point a few miles south of Rideau Junction to the west focus. This will add but three miles to the distance travelled by these trains. The time consumed in covering this extra distance will offset the time taken to make this back-up movement, and will simplify operation.

The Prescott trains will be operated from Chaudiere Junction to the Union Station over the Canadian Northern line.

Passenger connection through Hull for northern points will be made over the Alexandra Bridge.

The passenger station in Hull will be located on the line connecting the Alexandra Bridge with Maniwaki Junction, as shown on Drawing No. 11.

The coach yards will be placed to the south-east of the passenger terminal.

Freight Terminals, Ottawa

In the two areas on the east and west, A and B (diagram, page 73), will be concentrated all the local freight facilities of the city, with the exception of such team yards as may be necessary further out. The arrangement is shown in more detail on Drawing No. 11.

The freight units on the east will commence at Laurier Avenue and will extend as far out along the trunk line as necessary. On the south of Laurier

Avenue will be placed the freight head-houses, shutting off the view of the freight yards and team tracks further south. The standard freight houses, now being constructed in large terminals, are of pleasing appearance. The freight yards and team tracks, at this point and further south, will be but a few feet above the canal level. Parallel units of the former will be constructed as required.

The area for this development will necessarily have to extend to the east of Nicholas Street for a distance of five or six hundred feet. Excavation on this property will be necessary. A sorting and storage yard will naturally lie immediately beyond Gladstone Avenue. Coal trestles will be placed in the low area adjacent to Gladstone Avenue and Nicholas Street.

A freight development on the west is proposed for the area to the west of Broad Street. The freight houses will head on this street and be parallel to Wellington Street extended. Parallel units will be constructed as the business grows. The team tracks in this area will be placed either to the west of the houses or to the north of them, fronting on Broad Street. The sorting yard will be to the west of the connection to the Canadian Pacific bridge. It will be larger in size than the one on the east, on account of the larger volume of industry and lumber business originating in this vicinity. Coal yards will also be placed on this area.

The general receiving and forwarding yards, engine terminals, shops, etc., will be placed at the focal points on the north, east and west, as shown on Drawing No. 12.

The freight traffic from the east through Hull will be broken up on the north side of the river and the local freight distributed to the east terminal over the Alexandra Bridge, or to the west terminal over the Canadian Pacific bridge, as is necessary.

Freight over the Toronto line of the Canadian Northern will be broken up at the large eastern yard, or, if the amount of freight from this line, destined for the Port Arthur line, develops to any considerable volume, it can be broken up at the present yard at Rideau Junction. This is a feature which must be left to the future for settlement.

Package transfer freight, and freight originating in the east district and destined for the west, or vice versa, will be moved through the tunnel.

Belt Line

The Canadian Northern Port Arthur line connecting the east with the west focus, as indicated on Drawing No. 12, will be developed as a belt line for all through freight business, except that to the north side of the Ottawa River, which will pass over the Canadian Pacific bridge. Streets must be opened with separated grades across this line.

Hull

It is proposed that in Hull there shall be developed a freight terminal which shall be part of the union terminal scheme. In a few years, the growth of the business in Hull will probably necessitate its being handled on some other basis than that of treating Hull as a way station as at present. This freight terminal will be located adjacent to the proposed passenger station.

Clearing System for Handling Freight

Much attention is being given, both on this continent and in Europe, to the possibilities involved in the establishment of a "clearing" system for freight in a city. The first step in such a development is the establishment of union receiving and forwarding houses. The freight is handled between these and a central clearing house outside the city, which distributes it to, or receives it from, the different roads. Ottawa is in no way ready for such a development at the present time, but the railway plan, as laid down, is the first step in a development of this character.

Abandonment of Lines

In this plan it is proposed ultimately to abandon the following lines and railway areas:

The Grand Trunk cross-line from Britannia to Gladstone Avenue at the Rideau Canal, including yards and tracks.

The Chaudiere branch and yard of the Grand Trunk.

The line of the Canadian Pacific from Broad Street to Chaudiere Junction, and from Chaudiere Junction to the Sussex Street yard. (Certain portions of this line may become part of a double track belt line).

Small portions of the main lines of the Grand Trunk and of the Canadian Northern near the east focus.

The Canadian Pacific yard in Hull, and the North Shore line from the present Hull station to the Gatineau River.

The Somerset Street yards of the Grand Trunk and Canadian Pacific.

Part of the Canadian Northern area between the Rideau River and Nicholas Street.

While it is not strongly recommended that the Sussex Street yard be immediately abandoned, this is recommended for ultimate abandonment for the reason that it is thought that the overhead cost of its development and connection, on the tonnage which it will be likely to develop, will be greater than the cost of handling the same business in the general eastern freight terminal. A proper connection under the new plan will necessitate an expensive tunnel.

It is proposed that all the industries and lumber yards, situated along the abandoned lines, shall be removed to the area lying between the Canadian Pacific main line and the Ottawa River, west of the city, or to the industrial area proposed around the east focal point.

It may be asked what is to be done with the railway, lumber and industrial areas which may be abandoned under this general terminal arrangement. A study will show that, in nearly every case, these areas lend themselves to subdividing for building lots, or for use as highways. The cross-town line of the Grand Trunk is essentially of this character. So also are the lumber and industrial areas scattered along it. The Sussex Street area of the Canadian Pacific is of a similar character. Along the Chaudiere connection of the Grand Trunk, and the Prescott line of the Canadian Pacific, however, a certain amount of physical alterations will be necessary to bring the railway area into conformity with the streets on each side of it.

There will also be isolated activities which now have, but under the recommended plan are not provided with, railway connections. For instance, the Experimental Farm has in this plan had its railway connection removed. It is suggested that such service as may be required be given by switching at night over the street railway tracks. There will be little required, and what is necessary can hardly be said to be objectionable.

Estimated Future Traffic

Passenger:

Present number of passengers per day.....	4,600
" " " trains " "	65
Future passengers, per day.....	23,000
" trains, " "	320

L.C.L. Freight:

Present L.C.L. freight per day.....	114 cars
Future " " "	570 "

Team Track Freight:

Present freight per day.....	113 cars
Future " "	515 "

Industry Freight:

Present freight per day.....	62 cars
Future " "	130 "

Total Local Freight:

Present total local freight per day.....	289 cars
Future " " " "	1,215 "

Facilities Provided in Plan

In the plan laid down, the following facilities have been provided:

Passenger:

Union Station, Ottawa:—

Through tracks	11
Capacity, trains per day	165
Stub tracks	16
Capacity, trains per day	250
Total number of trains provided for	415
Average number of passengers per train	100
Total number of passengers per day	41,500

Local Station, west of Broad Street.

Local Station in Hull.

L.C.L. Freight:

Capacity, east terminal		420	cars per day
"	west "	360	" "
"	Hull "	60	" "

Team Track Freight:

Capacity, east terminal		628	cars per day
"	west "	800	" "
"	Hull "	110	" "

It may be stated that the expansion of facilities is not limited to these figures. Two or more freight house units can be placed parallel with each other heading on Broad Street or Laurier Avenue. Team areas, much larger than the ones suggested above, can also be arranged in the western freight area. Also, there can be arranged in the eastern freight area, team yards to a capacity of 1,600 cars. Other team yards should be located at points on the east beyond the Rideau River, at points on the west along the main line, and at points on the belt line.

Advantages of Plan

The scheme presented has the following advantages :—

It reduces the number of rights-of-way.

It eliminates practically all the cutting up of the city by the railway lines, which at present exists.

It practically eliminates the "Y" areas and reduces and concentrates the railway areas occupied within the city to a minimum.

It lends itself to the arrangement of both passenger and freight facilities along a trunk axis.

It removes all intersections of main tracks.

It reduces grade separation to a very simple problem.

It makes possible the almost complete separation of freight movements from passenger movements.

It has no bad grades.

It uses almost entirely existing railway rights-of-way and area.

It lends itself to progressive development as the financial and traffic conditions warrant.

It is a general scheme to which improvements on almost any road entering the city can be co-related.

Development of Plan

It is assumed that one of the first improvements to be carried out will be the complete development of joint passenger facilities at the Central station. This will lead to the construction of the tunnel connecting the Canadian Pacific main line west of the city with the Grand Trunk station. It will be sufficient for many years to come, in order to handle the Canadian Pacific passenger trains to the west, to re-locate the canal a little further to the west and to construct additional through tracks connected with the tunnel, on the area at present occupied by the canal. Five through tracks can be accommodated without touching the present terminal building. They can be served from the present concourse by a foot passage crossing them either at grade or by means of a subway.

A question, which will soon be almost as pressing as the arrangement of Canadian Pacific Railway passenger facilities, is the development of additional freight house tracks. With the abandonment of the Broad Street passenger station, the natural thing will be to commence at that point the development of the western freight district, and construct new freight house facilities on the site of the present station, beginning with the first unit of the ultimate development.

The same general statement is true of the Grand Trunk freight house and team track area adjoining their passenger terminal. When facilities are increased, a plan should be drawn, having in view its abandonment as a freight area. This would be no hardship on shippers, since the location south of Laurier Avenue is as close to the centre of gravity of package freight shipments as is the present Grand Trunk freight house. In the construction of new commercial buildings in the present freight area north of Laurier Avenue, there should be kept in mind the future requirements of the enlarged passenger terminal. The foundations and columns of the new buildings occupying this area should be arranged to permit of the use of the basement floor for the enlargement of the passenger station.

Certain elements, such as the location of team yards, sorting yards, and coach yards, between the canal and the Rideau River, will offer difficulties which will not be overcome until the whole terminal scheme is developed. There is involved the abandonment of the cross-town line, and with this, the re-location of the yards and industry situated along it. The abandonment of the Sussex Street line and yards, and of the Prescott line, is dependent on the complete development of the plan.

The abandonment of the Chaudiere line of the Grand Trunk can be carried out at any time, and traffic from the Grand Trunk for the west area operated over the Canadian Pacific Prescott line.

It may be difficult for some to see the necessity for all these changes in a city of 100,000 people. With a city of 200,000 or 300,000 people, and covering twice or three times the area which Ottawa does at present, it must be apparent that a re-arrangement of the railway situation will be necessary. It is desired throughout all this discussion to emphazise the point, that the re-arrangement of lines and the further development of the city must go hand in hand.

Table of Estimated Capacities of Present Facilities

Railway	Yard	Cars		
		L.C.L.	Team	Coal
Canadian Pacific...	Broad Street.....	75	160	13
	Sussex Street.....	4	43	..
	Hull.....	5	77	3
Grand Trunk.....	Central Station...	55	75	28
	Bank Street.....	..	27	27
	Somerset St.....	..	30	4
	Chaudiere.....	..	90	..
Ottawa & New York.....		10	120	10
Canadian Northern.....		5	43	..
Total, Ottawa, East.....		74	308	65
" " West.....		75	280	17
GrandTotal, Ottawa.....		149	588	82
" " Hull.....		5	77	3

COMPARATIVE PASSENGER TRAFFIC TABLE

City	Population	Passengers Daily	Trains Daily	Ratio Passengers to Population
Omaha	124,000	20,000	108	1:6
Kansas City	248,000	28,000	300	1:9
Chicago	2,300,000	69,600	593	1:33
Washington	331,000	41,000 (Max)	...	1:8 (Max)
		14,500 (Normal)	252	1:23(Normal)
Ottawa	100,000	4,600	65	1:22

DRAWING No. 10.

Diagram showing interference with Street System by Railroads.

A.—At present.

B.—As proposed.

This scheme provides for the abolishing of all grade crossings.

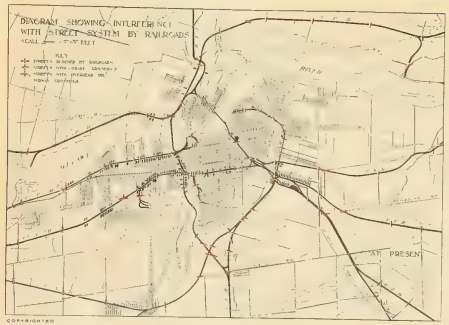
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B.—As proposed.

L.H.BENNETT CONSULTANT ON CITY PLAN
L.L.COWENS CONSULTING ENGINEER
JANUARY 1915

DRAWING No. 11.

General Railroad Plan showing retained and abandoned lines within the cities.

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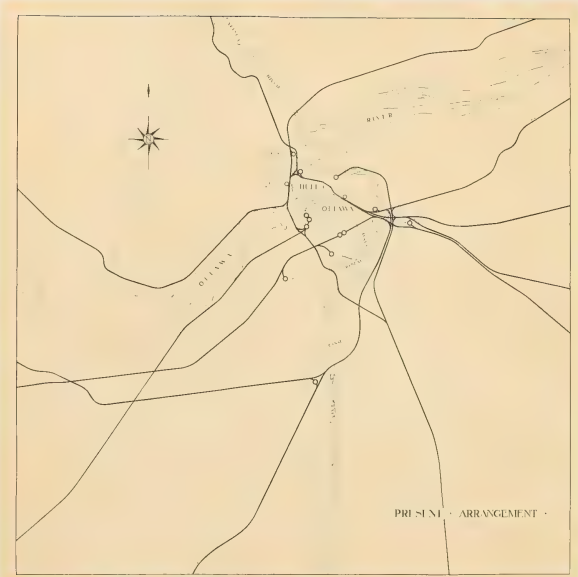


DRAWING No. 12.

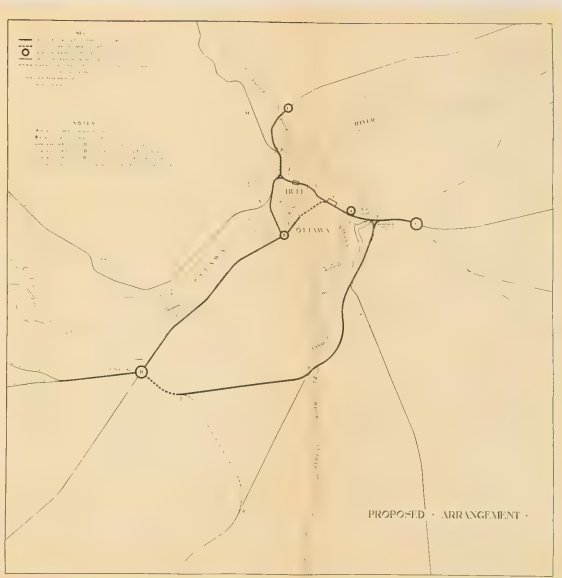
General Diagram of Railway Entrances into Ottawa and Hull and their grouping in proposed plan, showing Present Arrangement and Proposed Arrangement.

DRAWING No. 12.

General Diagram of Railway Entrances into Ottawa and Hull and their grouping in proposed plan, showing Present Arrangement and Proposed Arrangement.



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GENERAL DIAGRAM OF RAILWAY ENTRANCES · ·
INTO OTTAWA AND HULL AND THEIR GROUPING IN PROPOSED PLAN ·
SCALE MILES · · ·

DRAWING No. 13

Profiles of present and proposed railway grades within the city.

(1) Line from Central Station to Hull. (2) Lines from Hull to Broad Street Freight Yard. (3) Belt Line from main line east of Rideau River towards Britannia. (4) Proposed main line through Tunnel.

Under the scheme as outlined on these profiles it is possible to absolutely eliminate all grade crossings across the railway right of ways.

For plans in connection with the above, see Drawings No. 10, 11, 12 and 21.

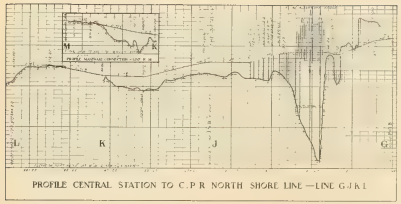
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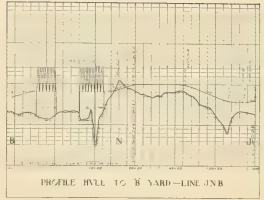
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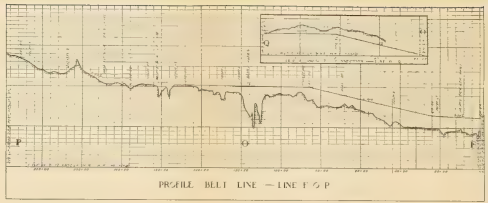
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PROFILE CENTRAL STATION TO C.P.R NORTH SHORE LINE — LINE G J K L



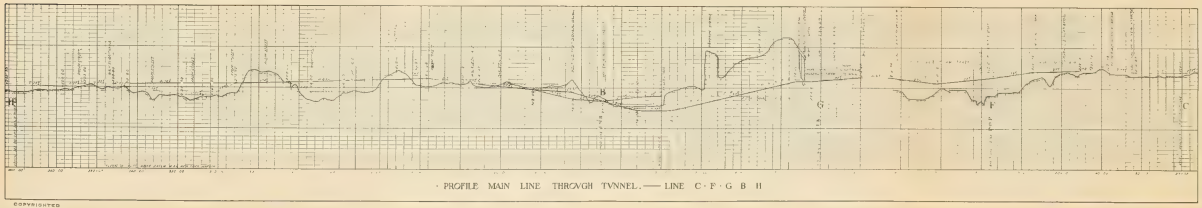
PROFILE HULL TO 'B' YARD — LINE J N B



PROFILE BELT LINE — LINE F G P

LEGEND.
PROPOSED GRADE LINE ——
PRESENT GRADE LINE ·····

SCALE.
HORIZONTAL 1 in.
VERTICAL 1 in.



PROFILE MAIN LINE THROUGH TUNNEL. — LINE C · F · G B H

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PROFILES OF RAILROAD LINES · · ·

SHOWING CHANGES IN ELEVATION OF RETAINED LINES AND GRADES OF PROPOSED LINES · · · · · ·

E.H.BENNETT CONSULTANT ON CITY PLAN
E.L.CASSIUS CONSULTING ENGINEER
JANUARY 1915 · · · · · · · · · · · ·

GOVERNMENT BUILDINGS

Choice of Site for New Buildings

Consideration of the constantly increasing number of necessary buildings for Government purposes shows that it is essential to lay down a definite scheme for future development without delay, and to consider first, the total amount of area which will ultimately be required, and second, the best locations for future buildings to be erected on that area.

Expansion along the Ottawa River to the east and west of Parliament Hill, is the logical course, being out of the line of commercial development. Here there is offered splendid architectural opportunity. In fact, of the well-known cases where capital buildings are located on water or river fronts,—London, Paris, Berlin or Budapest,—few, if any, equal the opportunity offered by nature at Ottawa.

Expansion to the south is out of the question on account of the high value of property and interference with long established business. This reaches its highest development on Sparks Street, between Bank Street and the Rideau Canal. It must, therefore, take place to the west, along the Ottawa River and between it and Wellington Street, and thence across Wellington Street at Lyon Street, to the bluff between Lyon Street and Bronson Avenue.

To the east, Sussex Street offers the obvious line of development. There would be little interference with important business interests, while land values are comparatively low. Expansion may take place on both sides of the street, beginning at George Street and continuing as far as the neighbourhood of the Mint. Such buildings as the Basilica and the hospital may be left alone without any detriment to the architectural scheme.

Estimate of Area Required

To forecast the growth of government offices, the increase of employees and the number of departments, involves such uncertain factors as the rate of the country's growth and the activities of the Federal Government. Figures, however, have been gathered which may prove of some help in determining how much additional ground should be set aside or acquired for future expansion.

The present number of officials and employees in Ottawa, not including those engaged in local post offices, local customs house, museum, mint, etc.

is approximately 6,000. The gross floor space in use is estimated at one and three-quarter million square feet. The average space occupied per person is 290 square feet. With the present population of Canada of 7,200,000, requiring one and three-quarter million square feet of floor space for its government offices, a population of thirty millions would require seven million, three hundred thousand, square feet.

But in Washington, the gross area of government offices is seven million three hundred thousand square feet. On this basis when Canada shall have reached a population of thirty million, or one-third that of the present population of the United States, the floor space required would be approximately two and one-half million square feet.

These two estimates for floor area, necessary for government purposes when Canada's population has reached thirty million, are so wide apart as to be practically worthless in arriving at a satisfactory estimate for determining the size of the government group. Another indication, however, is to be had in the relation between the population of the whole country and the number of government workers employed in the offices of the Capital.

In Washington, in 1850, there was one employee to every 15,000 of population. In 1900, there was one employee to every 4,000 of population. In 1910, there was one employee to every 3,000 of population.

In Ottawa, in 1914, there was one employee to about every 1,300 of the population.*

It will be seen from this that in the United States the tendency is for the government employees to increase at a faster rate than the population, and it is probable that in the future the ratio of population to the number of government employees will tend to reach a constant number. This may be expected, also, in Canada. For purposes here, a figure of one government employee to every 2,000 of population of the whole country has been chosen, and on this basis Canada will require, when the population is thirty million people, (or in about forty years), a floor area for government purposes of over four million square feet.

The above estimate covers only necessary floor area, and will be subject to some modification, due to architectural design. A much larger area than this must be provided to give the proper setting for buildings of this character.

In Washington, the area of the grounds occupied by buildings of the Legislative, Judiciary and Executive Departments, is approximately 300

* The Federal Government of Canada controls in detail at Ottawa many matters that are directly under State control in the United States, thereby greatly increasing the number of employees in proportion to total population when compared with the United States.

acres. Topographically, this entire area is suitable for buildings, and does not include areas used for public parks.

To provide a floor space of four million square feet, there is required in Ottawa a site of 120 acres. It will be seen that less area is required in Ottawa than in Washington in proportion to the floor area provided. This economy is made possible by the wide expanse of the Ottawa River, in itself a setting to equal which in other places many millions of dollars have been spent.

General Plan of Expansion and Character of Architecture

Attention is directed to the general plan of expansion which accompanies this report, (Drawing 14). The development follows the general direction of the Ottawa River, both east and west of Parliament Hill.

East of the Rideau Canal and following northward the line of Sussex Street, it is proposed to place what may be called the industrial plant of the Government, such as a new Printing Bureau, the Mint, Laboratories, and Storehouses, etc., etc. The less important buildings should occupy the lower ground along the east side of Sussex Street, between York and St. Patrick Streets, and may, therefore, be of simpler architectural treatment. These blocks may be extended back eastwards as necessity arises.

It is highly essential that the west side of Sussex Street be reserved by the Government as sites for Museums, Art Galleries, Historical Societies, Auditoriums and other buildings of semi-public character. The present buildings used for the Printing Bureau must be removed and replaced by a group more worthy of the site. The Government must, for its own protection, gain and exercise control over the character, design, colour, height, cornice heights, and to some extent the use of buildings erected on this property, to the end that these may enhance the appearance of Major Hill Park.

West of the present west block and north of Wellington Street, on the property recently acquired by the Government, could be placed the beginnings of the new Departmental Buildings of which the Government stands so badly in need. This area extends west beyond Bay Street. These new buildings should be kept 150 feet west of the West Block. Their face should extend parallel to Wellington Street, on a line with the south front of the West Block. The axes of Bank Street, Kent Street, Lyon Street and Bay Street must be carried through to the river in order to leave openings between the various blocks at least as wide as the streets named. The river front of the buildings would follow roughly the building contour of the bank.

The separation of groups of buildings, either by intervening streets, or

on account of topographical conditions, does not render the scheme of expansion in any way objectionable. The various groups would be assigned to departments independent of each other, and not requiring immediate and direct connection.

The various subdivisions of the entire composition are connected, not only by Wellington Street and Sussex Street, but also by a succession of courtyards, walks and drives.

The Government must, by legislation or arrangement, obtain sufficient control to regulate the character of the new buildings, which may, from time to time be erected along the south side of Wellington Street, as to height, colour, material and general architectural design, and to some extent the uses to which the buildings may be put.

The accommodation of the present Parliament Buildings is now inadequate, and extensions will have to be undertaken in the comparatively near future. The question of their expansion is one requiring good judgment, and most careful study. As the population of the country increases, so will the number of Members. This will necessitate the enlarging of the House, or possibly the entire remodelling of it. This may be done by extensions in the form of wings, as indicated on the plans, for the accommodation of the Senate and the House. The present Library may then be extended into the space vacated.

One cannot look without reluctance upon any project to change the general architectural character of the present group of buildings. Not that criticism may not be levelled at them, but because of the general harmony of the group, and the happy expression which has been given to them, seemingly in character with a northern country. It is an architecture of towers and pavilions. It is vertical in character, and has been modelled carefully as a whole. It has a most distinctive silhouette which contrasts very charmingly with the long, level sweep of the Chelsea Hills behind.

As seen from Major Hill Park and from Nepean Point, the well-wooded banks form a noble setting for the buildings. These should not be marred by discordant constructions near the shore line, and such as now exist should be eliminated or modified in form, material and colour, in harmony with the surroundings.

Whatever changes the central block of the Parliament Buildings may undergo, the architectural design of the proposed new buildings should be in harmony and not in contrast. They should be planned to have an architectural character with vigorous silhouettes, steep roofs, pavilions and towers, never competing with, but always recalling the present group. At the same

time, it is assumed that certain architectural defects in detail will not be repeated in the proposed buildings. In the design of these, inspiration may be derived from the close and sympathetic study of the beautiful buildings of Northern France of the 17th century.

Generally speaking, the external architecture of the Chateau Laurier, though it may require refining in detail, may be regarded in general outline and character as a worthy suggestion for an architecture of vertical composition, such as is suggested for the new group.

Turning to the consideration of the group on Wellington Street, it is well to establish the conditions controlling its composition.

In the first place, it is necessary to recognize that Parliament Hill, because of the importance of its buildings and its natural elevation, is and always must be the dominating feature of Ottawa. All other parts of the Government group must be subordinated to this, architecturally as well as actually, and instead of rivalling or competing with it, should increase its relative importance and enhance the beauty and dignity of its buildings. The House of Parliament standing back from Wellington Street on the great court, marks this spot as the point of interest in the general arrangement. Nothing of a similar character, to belittle that which already exists, should be placed on Wellington Street.

In the second place, streets intersecting Wellington Street must be recognized and considered in determining the arrangement of the new buildings. Unfortunately, the relation that ought to exist between the Government buildings and the street system of the city was not recognized at the time the Parliament Buildings were erected. The lack of a main axial approach, such as would result if Metcalfe Street were a wide avenue on a line with the axis of the Victoria Tower, is much to be regretted.

Consistent with its dignified purpose, it is believed that such a scheme will result in the maximum capacity.

Distribution of Floor Space

The additional floor area according to the plans suggested (Drawing No. 14), is approximately 3,650,000 square feet, divided as follows:

Proposed group between Wellington Street and the Ottawa River, west of the Western Block	1,500,000	sq. ft.
Lyon Street group situated on the south side of Wellington Street	1,500,000	"
Sussex Street group	650,000	"
Total	3,650,000	"

The area of floor space at present occupied, (rented or owned), by the Government is 1,750,000 square feet. There will be required in the immediate future about 1,000,000 more square feet.

Floor area has been calculated upon the basis of buildings of five stories, areas of basements not included. This is not to be considered as absolute, but represents the probable average to be derived in buildings architecturally suitable, in our judgment, for Government offices in Ottawa.

According to the plan, the development may be gradual and progressive as the functions of the Government increase, and as funds are made available.

Ottawa is the Capital of the country, and the residence of the Governor-General and it is rather a reflection on us that the connection between Parliament Hill and Rideau Hall is by means of a very commonplace street of no importance, no dignity and no beauty, when by the expenditure of no great amount of money it could be converted into a fine handsome approach in keeping with its purpose. The Government should take up the question at as early a date as possible, quite independent of the general scheme. So far as the City of Ottawa itself is concerned the street as it is probably answers well enough, but for the sake of the prestige of the country and the importance of Ottawa as the Capital, the matter should not be permitted to remain in abeyance.

DRAWING No. 14

Plan of Government centre, and Ottawa and Hull water-fronts, showing recommended developments and extensions, as related to Wellington and intersecting streets and to the river banks.

The relation between the municipal and railway centre with the Government group is apparent from this drawing. The proposed Bronson Avenue connection with Wellington Street, the development of Wellington Street, the Laurier Avenue tunnel and approaches to the Alexandra Bridge, together with a treatment for Major Hill Park Boulevard are indicated.

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JANUARY, 1915

DRAWING No. 15

City of Ottawa—General view, looking southward from Hull, of the river front and the Parliament Buildings, proposed departmental and court buildings and future extensions. The proposed buildings are arranged so as to conform with the city streets, Wellington Street being taken as the base line of the group. The intersecting streets have vistas through to the river, or are marked, as at Lyon Street, with a tower.

A plan of the above is shown on Drawing No. 14.

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JULES GUERIN, LANDSCAPE ARTIST
JANUARY, 1915.

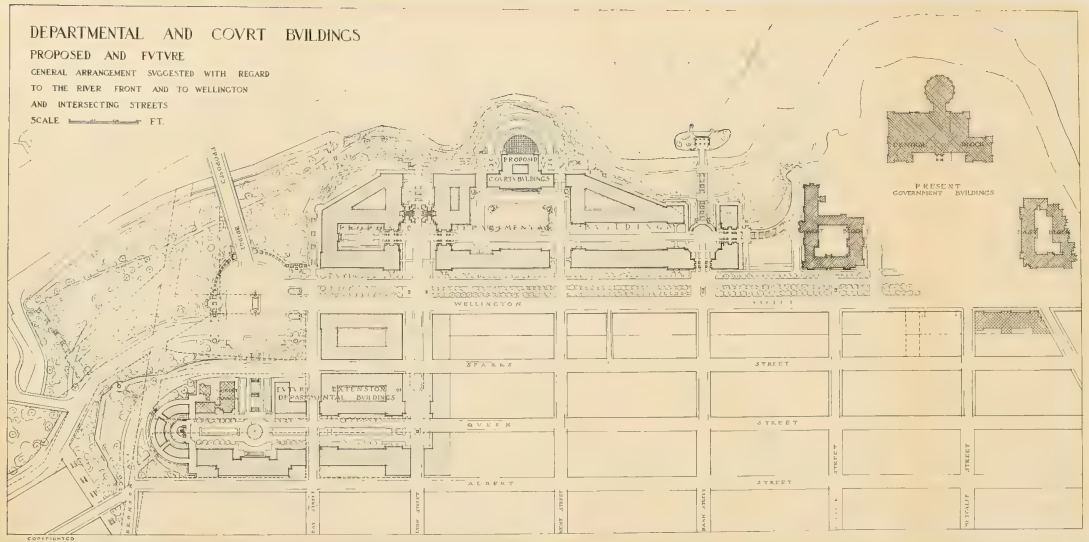
DRAWING No. 16.

Departmental and court buildings, proposed and future.

This plan is a detail of Drawing No. 14.

DRAWING No. 16.

Departmental and court buildings, proposed and future.
This plan is a detail of Drawing No. 14.



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JANUARY, 1918

DRAWING No. 17

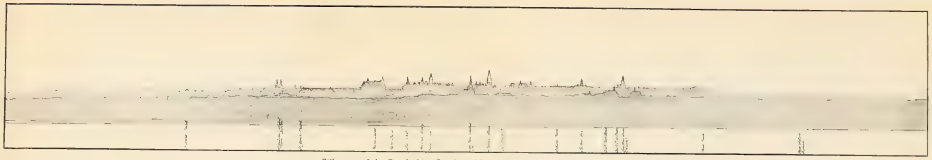
GENERAL SILHOUETTES EXISTING AND FUTURE PUBLIC BUILDINGS

These silhouettes are impressions from distant points, and express the importance of building height regulation in its direct relation to the Government centre.

DRAWING No. 17

GENERAL SILHOUETTES EXISTING AND FUTURE PUBLIC BUILDINGS

These silhouettes are impressions from distant points, and express the importance of building height regulation in its direct relation to the Government centre.



Silhouette of the City looking Southward from a point on the Chelsea Road.



Silhouette of the City looking Northward from a point on the highlands Southeast of the City.



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Silhouette of the City looking Eastward from a point on the North shore of the Ottawa River.

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DRAWING No. 18

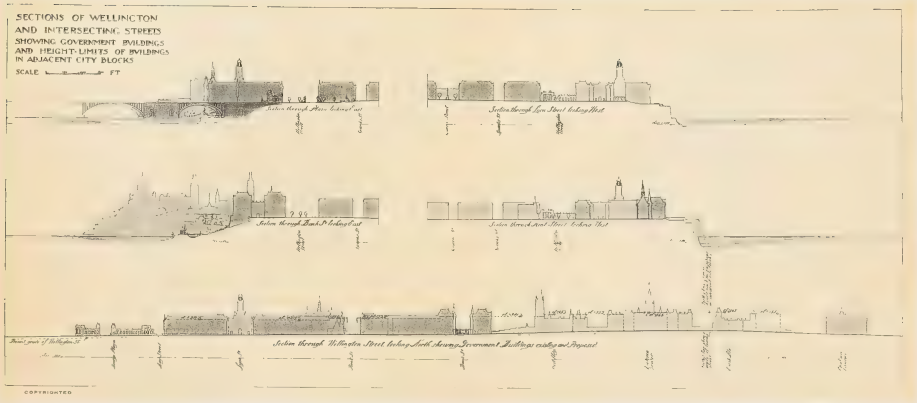
Sections of Wellington and intersecting streets, showing Government buildings in adjacent city blocks.

Heights of buildings and their relation to the Government group may be studied from the section on "District Control."

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Sections of Wellington and intersecting streets, showing Government buildings in adjacent city blocks.

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JANUARY, 1913

DISTRICT CONTROL

General Problem and Method of Procedure

The potential qualities of a city must be revealed before a proper basis is afforded for sound regulations and such regulations will, no doubt, have to be revised from time to time to meet changes in social and economic conditions of which no evidence is now apparent.

The problem of districting or zoning the city, with respect to the various utilities to be made of the areas in different sections, resolves itself into a consideration of the forces at work shaping the direction and quality of the business, industrial and residential growth, so that the two former will not develop in a way that shall be detrimental to the latter. Districting is a defensive and not an offensive measure.

General Districting

While certain blanket regulations may be established, it must be recognized that the restrictions of a subdivisional nature must also be allowed to play a great part in the solution of this problem. That building lots sold under restrictions find ready sale has been shown by experience in other cities.

The natural tendency of business to flow along the routes of transportation and travel and to concentrate at the centre of distribution, and of industry to grow along railway lines and around railway centres, shows the forces which have to be controlled. This can be done either by prohibiting business development along a street, by prohibiting industrial development along a railway line or by a re-alignment of transportation and railway lines. It is only by some control of this kind that large residential areas may be protected. It is safe practice, therefore, after a study of the tendencies within the city and of the districts best adapted to each purpose, to determine upon certain areas within which only certain classes of development shall be permitted.

Local Districting

Having determined these general districts, the question becomes one of detail. The common practice is to control the quality of the development within the business or the residential districts, by restrictions on the heights of buildings for various classes of occupancy, on the building line and on the proportion of the whole area which may be occupied. A street becomes a district in itself, the presence or absence of business having been

controlled by the existence of a car line, or by the consent of property frontage within a given area or distance, or else governed by an occupation restriction imposed by the subdivider of the property and approved by the civic authorities.

The most lax building laws provide that two or more family buildings shall occupy only a certain percentage of the lot. In some, it is provided they shall bear a certain relation to the width of street. Few of these building ordinances, however, go far enough in this respect. It is possible under them, for instance, for apartment houses to grow up in a good residential district and completely destroy the advantages of the air and sunlight to adjoining property. These apartment houses are a most intensive use of the property and often out of all keeping with that which is made of the surrounding area.

The tendency of small business and light manufacturing to invade residential neighbourhoods is a minor rather than a major question of districting. The former is to a certain extent necessary and under certain conditions a benefit and convenience, but the latter results generally in tall lofty buildings being placed within these residential districts.

Districting in Europe

The practice of districting is much further developed in Europe than it is on this continent and the control is stricter. Regulations as to height are enforced in England, Germany, Sweden, Austria, Hungary and France, as are regulations for occupancy.

While the practice varies considerably in different cities, regulation goes very far in its scope. In Europe, there is evidence of a growing complexity and limitation which may prove detrimental. Briefly stated and quoted from a late report for the city of New York,* these regulations are:

"The district system is a method of regulating buildings as a part of a general city plan. It has two characteristics; it groups buildings of different classes, and it limits the density of buildings progressively, allowing buildings to be higher, and to cover more of the lot in the centres where land values are greater and business needs require more concentration, and making the requirements more and more severe as the distance from these centres increases.

" . . . . . the height of buildings is invariably regulated with relation to the width of the street upon which the building is situated; and also, usually, by a maximum which, irrespective of the width of the street, it must not exceed. In many cities, in the zone or zones

* Report of the Heights and Building Commission, New York.

of greatest concentration, a height a little in excess of the street width is allowed; in other zones it must not exceed that width, and in the outer zone or zones the maximum limits it to less. Usually, too, there are minimum courts, and all rooms constructed for the residence or long continued business use of mankind must have a window upon a court of at least a specified size. The proportion of the lot that may be covered by buildings, also, is almost invariably limited progressively, buildings on corner lots in each zone being allowed to cover more than those on inside lots. The ordinances in the different cities differ in detail, but in general the system is the same.

. . . . . Another tendency in modern building ordinances is to make rules for streets in addition to rules for districts. It is recognised that the chief business streets should receive different treatment from the minor business and residence streets, and the chief traffic streets different treatment from either. The allowed height and amount of lot to be covered increases with the importance of the street and decreases very greatly the moment the principal street is left behind."

Practice in America

During the last few years, legislation has been enacted by New York State, Pennsylvania, Massachusetts, Minnesota, Wisconsin, Maryland and Virginia. Ontario has legislation for cities of 100,000, permitting them to pass by-laws affecting the location and erection of buildings used for various purposes. Ordinances have been passed in Richmond, Milwaukee, Minneapolis, Seattle and Los Angeles. This legislation shows a distinct trend toward the creation of specially restricted residential districts. One or two of these may be cited:

Minnesota

The legislature of Minnesota at its last session passed an act empowering the cities of Duluth, Minneapolis and St. Paul to establish residential and industrial districts. The city council, when petitioned by 50% of the property owners in a district, may, by a two-thirds vote, designate them as being either residential or industrial districts. The erection and maintenance of any industrial or business establishment, no matter what its character, may be excluded from a residential district. Even tenements, apartment houses and hotels may be excluded from such a district. In the designation of industrial districts, the city council is authorized to classify the various industries and, in its discretion, to restrict each class to a definite and limited area. Upon a petition of 50% of the property owners in a district, the council may set aside its original restrictions, and establish an industrial district in a residential district, or vice versa.

New York

In the recent report on the question in New York,* recommendations with regard to height and bulk of buildings is given the chief consideration; it is recognised, however, in this report, that, although the height limitation is sufficient to control certain objectionable features in residential districts, taken alone it falls short of complete solution. Legislation has been obtained to enable the appointment of a commission for the establishment of districts.

Los Angeles

In Los Angeles, the first districting ordinance was passed in 1909. The entire city, with the exception of two suburbs, is divided into industrial and residential districts. There are twenty-five industrial districts and one residential district. The residential district comprises the whole regulated territory, exclusive of the areas within the several industrial districts. It therefore encircles and surrounds many of the industrial districts.

The so-called industrial districts do not fairly indicate the extent of the industrial area of the city. In addition to the industrial districts there are fifty-eight areas in the residential district known as "residence exceptions," which are exempt from the regulations applicable to the residential sections and in which business is permitted subject to certain conditions.

The industrial districts vary considerably in shape and size. The largest district has an area of several square miles. At its greatest dimensions, it measures five miles in length and two miles in width. The smallest district comprises one solitary lot. The combined area of the several industrial districts aggregates not more than one-tenth that of the residential district. The industrial districts are on the whole pretty well grouped in one part of the city.

RECOMMENDATIONS

In a broad general way, the recommendations for Ottawa and Hull have been made with the view that the business and industrial districts, if controlled as suggested in the plans, will be so disposed that the residential areas as a whole will be safeguarded and conditions of permanence, as to the nature and value of these areas, be brought about.

It would be useless to expect well considered regulations to be practicable without the provision of adequate street car service, of a good street system, and of proper railway development. These matters have been dealt with

* Report of the Heights and Building Commission, New York,

in other parts of the report, and a well balanced system for the future is assumed in this discussion.

A partial method of districting a city lies in the study and carrying out of improvements in such a way that they will automatically result in attracting to a district a class of development for which it is best suited. The plan as laid down has this as one of its prime objects. It can accomplish this, however, only in a broad way, and the area devoted to a certain class of utility will be one with indifferent and ragged edges. It cannot control in the details.

To reinforce the plan, it is proposed that certain blanket restrictions shall be established.

These restrictions, shown on Drawing No. 19, Diagram "B," create the following:

(a) Industrial areas.

(b) General railway and transport areas.

(c) A central business district to include retail, wholesale and light industry.

(d) A central residential district.

(e) An outer or general residential district.

(f) A suburban residential district at present unplatted.

These general districts will be subject to subdivision into smaller units.

Industrial Areas.

It is recommended that three heavy industrial areas be established. One of these, (a_1) shall centre round the focus of the railways on the east side of the city. It shall consist approximately of about five or six hundred acres, not including the railway areas in that district. In this district shall be situated all of the smoke-producing industries which will come to Ottawa, and also such public and private activities as may be likely to prove a nuisance.

A second industrial district, (a_2) shall be established on the west side of the city, between the Canadian Pacific main line and the Ottawa River. This district shall extend across the Chaudiere Falls into Hull. In addition to the area at present in use there by industries, provision is made for the development of about 400 acres. Smoke-producing industries shall not be located in this district on account of the fact that the prevailing winds in Ottawa and Hull are from the west and northwest. In this district it would be well to place much of the lumber storage area necessary in the cities.

The third industrial district, (a_3) which it is proposed to develop, lies to the east of the International Cement Company plant, in the neighbourhood

of Leamy Lake and the Gatineau River. This district provides about six or seven hundred acres.

The general recommendation which is made is that industry requiring large space and lumber and other storage yards shall be confined within these areas.

Railway Areas

In the railway section of this report, it is strongly recommended that two general areas be developed for railway purposes. One of these, (b_1), shall be on the east of the city and shall extend as a narrow strip from Rideau Street along the east edge of the canal out to the eastern industrial district. This strip is to be kept as narrow as possible, compatible with the necessities of the railway business. A second railway district, (b_2), is to be established in the western industrial area extending from Broad Street westward and lying between the Canadian Pacific main line and the Ottawa River. The railway area proposed in Hull is a narrow strip along the line connecting the Alexandra Bridge with Maniwaki Junction.

In these proposed railway areas shall be concentrated all the passenger and freight business of the city. They may be developed progressively, as the necessity for service in the cities develops and the railway business grows.

Dockage Areas

It is recommended that a general water transportation area be developed around Victoria Island on the Ottawa River and supplied with rail connection. This will be the main water terminal district for Ottawa and Hull, and all heavy bulk and industrial materials will be handled from this point, except such as is destined to the eastern district and this will be handled from a smaller terminal located in and as a part of the eastern railway district.

Central Business District

There is shown on drawing No. 19, diagram "B," a central district (c_1) within the area of which shall be restricted general business, warehouse and light industry.

The regulations within this central district consist largely of those relative to height of buildings and percentage of lot to be occupied, so as to give adequate air and light. The centre of this business district will be determined largely by transportation development, and the more concentrated these transportation facilities become, the more concentrated will be the development in this area. It is recommended that regulations be adopted which will limit the development of light industry to this central district or else to the main industrial areas already outlined.

Height Regulation

In the matter of height regulation, a request was presented early in the work of the Federal Plan Commission to the Municipal Board of Control of

Ottawa, recommending that buildings, erected in the future within the business district, shall not be more than 110 feet from the sidewalk level to the highest point of the building. The Board of Control urged the enactment of this regulation, which was passed and adopted by the City Council under By-law No. 3754, dated June 1st, 1914. Certain modifications of this regulation, as shown on the plans and as outlined herein, are now recommended.

If Ottawa and Hull are to acquire and retain the appearance of the Capital City, full precaution must be taken lest commercial buildings reach such a height as to detract from the beauty and importance of its government buildings. This is true both of the near views and of impressions formed from the first glimpses as one approaches the city, either by railway or highway. Already several buildings have been erected on Sparks Street, which threaten the dominating height of the Parliament Buildings. This dominance may soon be entirely taken by high office buildings on the adjoining blocks, unless steps are taken to limit their height. No need is apparent in Ottawa for buildings higher than nine stories.

Fortunately, the central building of the Parliament group stands on ground 30 feet higher than the highest point on Sparks Street, and 40 feet higher than the average level of Sparks Street directly to the west. Besides the existing Parliament Buildings, the proposed Departmental buildings west of Bank Street are also to be considered. Here the topographical relation between the proposed sites and the blocks on the south side of Wellington Street, west of Bank Street, is the reverse of that east of Bank Street.

The height regulations recommended for the business district are illustrated in Drawing No. 19, diagram "B." The existing and proposed government buildings are shown in silhouette on Drawing No. 17, with the height limits of buildings recommended in the business district shown in dotted line. The height is controlled by means of a series of horizontal planes, which allow for the highest development between Elgin and O'Connor Streets. These limiting planes range between elevation 365 above the sea level at Metcalfe Street, and elevation 317 at Lyon Street. Drawing No. 19, diagram "B," shows the limiting lines for different sections. They will permit of building to a total height of approximately 110 feet along Sparks Street near Metcalfe and O'Connor Streets, 105 feet at Bank Street, 92 feet at Kent Street and 80 feet at Lyon Street. These planes will control the height limit in the adjacent blocks southward from Wellington Street throughout the business district, with the further condition, however, that no building shall anywhere exceed a total height of 110 feet above the average curb elevation as regulated by By-law No. 3754, referred to above. The establishing of a lower limit, for building heights west of Bank Street on Wellington, Sparks and parallel streets as far as Laurier Avenue, is reasonable

owing to the fact that real estate values fall away sharply west of this line and therefore a lower height limitation will work no hardship on property owners. On Sparks Street, the highest buildings existing between Bank Street and Bronson Avenue have only three stories and most of them have only two stories.

Along Sussex Street the sky-line of existing and proposed public buildings should likewise be protected from domination by the height of commercial building in the adjacent blocks. Assuming that a five story development of public buildings takes place, the height of commercial buildings should be limited to a horizontal plane of elevation 300 for the blocks between Rideau and Murray Streets, of elevation 285 for the block between Murray Street and St. Patrick Street, and of elevation 270 for the blocks north of St. Patrick Street. These provisions apply to all the blocks east of Sussex Street. Considering that the present development on Sussex Street generally does not exceed 3½ stories, the above recommended limitations are regarded as entirely reasonable.

The importance of preserving the dominating sky-line of the Parliament and Departmental groups is illustrated in Drawing No. 17, showing the silhouette of the city.

In the business district of Hull, (c_2), it is recommended that the building height limit be sixty feet.

Central Residential Districts

The central residential district, (d) on Drawing No. 19, diagram "B," immediately surrounds the central business district. This district includes densely populated residential areas, small businesses, hotels and apartments. It is difficult to determine the restriction on this property for the reason of its high value; any but intensive use is not economical. The same general building restrictions that are applied to the central business section in Ottawa should be made to apply in this district, but in no case should a building be higher than 80 feet. This restriction as to height of buildings is for the maximum to be permitted. The question as to whether buildings as high as indicated shall be allowed, should be subject to local option and control by property frontages, under the direction of the administrative authorities. Care must be taken, however, to protect the poorer residential areas within this zone, so that living conditions may be bearable for those who are forced by their small means to live there. This is the housing problem of all large cities and no solution has, so far, been found for this difficulty. The main hope for the residents in this district lies in the provision of transportation lines which will bring outlying property into competition with it.

In Hull the height limit should be 40 feet for this district. This is district (d) on Drawing No. 19, Diagram "B."

District Control.

General Residential Districts

Control of general residential districts is, as a rule, confined to frontage limitations and to the protection of residences against the invasion of the large apartment house, light industry and small business. The principle involved in this control is that of maintaining harmonious relation between the apartments and business and the general character of the district. In this respect, they should not exceed three stories in height and should be required to observe the frontage line established for the residences. Whether the maximum height of buildings as outlined shall be permitted on the introduction of apartment houses on any street in this district, should be made subject to local option, under the direction of the administrative authorities. Light industry should not be allowed to invade these districts, and business should be limited to certain streets and in height and frontage, and controlled as are the apartment houses. This district is marked "e" in Drawing No. 19, Diagram "B."

A general frontage restriction is recommended requiring that all buildings in residential areas be set back from the sidewalk line a distance which will permit of an attractive garden or grass space in front.

Outlying Residential Districts

These districts marked "f" on Drawing No. 19, Diagram "B," require protection against the invasion of industry. This is provided for in the first section, and the remaining regulations, required in an area such as this, consist only of those which apply to size of lot and height and frontage. The size of the lot is now generally determined by the real estate speculator, but the authorities should regulate the depth and width of all lot subdivisions, so as to permit the circulation of air between the houses and to prevent the placing of two houses back to back on one lot.

There should be developed residential areas, adjacent to the industrial areas, where the workers can be housed, and the regulation and control of these should be carefully planned by the authorities.

It is recommended that the authorities exercise direction over the subdividing of areas within the limits of their control. A general suggestion is made on Drawing No. 21. It has been found that, in Ottawa and Hull and their surroundings, about three times as much area is laid out as is occupied,—two-thirds of the whole being unoccupied. It is probable that this is a varying ratio. As the city grows and expands, the unoccupied subdivided area will become greater in extent and will require more supervision.

Drawing No. 19, Diagram "A," shows the present distribution of population of Ottawa and Hull, and Diagram "B" shows the approximate distribution of a future population of about 350,000. The present average density of population, over the built-up area of Ottawa and Hull, is about forty people to the acre. The area of the built-up section is between

five and six square miles. This average density of population per acre has been increasing at a constant rate for the last thirty years.

In distributing the estimated future population of about 350,000, an average density of about thirty people to the acre has been allowed for. This would give a built-up area of about twenty square miles. The present ratio of built-up area to occupied area (three to one) would require a total platted area of about sixty square miles.

In controlling the expansion of the city by street car extension and proper subdivision, it should be kept in mind that a compactly built city furnishes the ideal condition. Compactness of occupied area is economical; it limits unnecessary expense in teaming delivery and transportation generally; it also leads to economy in paving and sewer and water pipe extensions; it does not leave the centre honeycombed with neglected and unsightly areas. The regulations and improvements suggested will naturally bring about a more regular and consistent grading of density.

Study by Special Commission

It is recommended that the whole subject be given thorough study by a special commission, which shall establish blanket regulations over general areas and shall develop, in co-operation with the property owners, a programme for definitely establishing frontages and building heights along each street of the cities,—in the down-town sections, in the residential areas and in the areas which will be developed in the future outside the cities.

An important feature of administrative control in cities, and one to which practically no attention has been paid in this country, lies in the regulation of the architectural appearance of buildings on a street, plaza or parkway. Buildings are often constructed facing on open spaces, and even on those on which public buildings are situated, without reference to any general scheme or architectural harmony.

MARKETS

The question of public markets is one which has engaged the study of special commissions in almost every city of the continent. No clear and definite general policy has so far been laid down which can be made to apply, without modification, to the varying conditions in different cities.

In some cities, the policy is towards one central market, where the wholesale and retail business is done in the same building. Another policy is to-

wards the establishment of a wholesale central market, with retail markets distributed throughout the different residential sections of the city. A third policy is towards the establishment of isolated wholesale and retail markets without any central market.

Without going into detailed discussion of the relative merits of these three general policies, it may safely be said that the second of them is the most flexible and, under proper control, will give the best results.

The wholesale market should be the centre for the handling and distributing of as much of the food supplies of the city as possible. It should be the centre not only for truck produce, but also for cold storage and other staple supplies. It should be as close to a focal point of the arterial street system as possible. It should contain, as part of its development, a proper and efficient cold storage plant. It should have around it adequate street space for standing vehicles.

Such a situation for this wholesale market is found in the neighbourhood of Gladstone Avenue and the Canal. At this point, rail and water facilities can be furnished and street car line can be given access. From this point, the street system distributes to any section of the city with comparative ease. This location, furthermore, is accessible along the trunk highways leading to the outlying country.

If it should be decided by the authorities that retail markets are advisable in Ottawa and Hull, they should be established throughout the residential sections of the cities.

The whole subject of markets, however, should be one for study and execution by either a competent market commission or some similar body. Whether the project be undertaken by the municipality, in which it becomes virtually the commission merchant and undertakes to bring the producer directly to his market, or whether it be the result of co-operative effort between the people, the producer and the commission merchants, there is little question but that much can be done along the lines of more efficient, economical and sanitary handling of the food supplies of the cities, than is done at present.

DRAWING No. 19

Diagrams of business, manufacturing and residence areas.

Diagram "A" indicates the present position of business, industry and residence; also the areas which varying industry will tend to occupy if the railways are permitted to remain and no attempt is made at control.

Diagram "B" offers, in a broad way, a scheme for restriction in conjunction with the railway revision. In the section under "District Control" is explained the suggestions for such control in land occupancy, building heights, etc., as are shown on this diagram.

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DRAWING No. 20

Diagram of present built-up area and population density, showing also probable future expansion.

Diagram A shows the present built-up area and the approximate variation in density. The waterways and railways are indicated as obstructions to expansion.

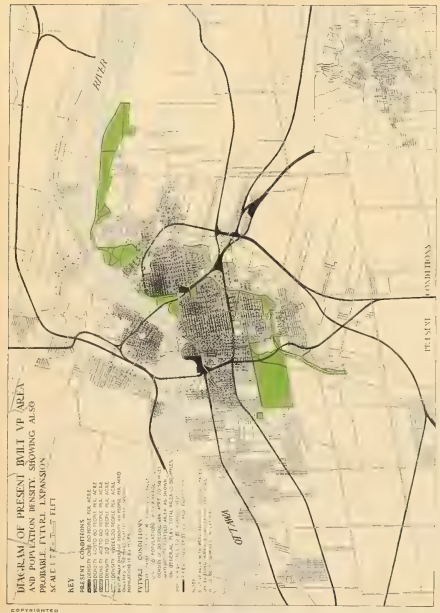
Diagram B shows the present built-up area, and the probable extent and direction of expansion in outlying areas, which is contingent on the construction of bridges across the waterways, revision of the present railway conditions and the separation of railway from street grades.

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A.—Present Conditions.

B.—Future Conditions.

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E.P. TAYLOR CONSULTING ENGINEER
JANUARY 1913

PARKS, PARKWAYS AND PLAYGROUNDS

General Considerations

There has been laid down in the plans a system of parks, parkways and playgrounds for a population of the Cities of Ottawa and Hull of 350,000 people.

The considerations which have governed the distribution of these parks have been:—

(1) The distribution of these parks in such a way that they will be accessible to the people, on the principle that the parks should be brought to the people, instead of the people being forced to travel long distances to the parks.

(2) The arrangement of playgrounds so that there will be a play field of from 8 to 10 acres within one-half mile of any dweller in the city. These playgrounds should provide room for athletic sports, gymnasiums and play fields.

(3) The connecting of parks by means of parkways and the making of the parks system continuous and comprehensive.

(4) The acquisition of property which has a character most suited for use as parks and least suited for use for other purposes, and which will require the least financial outlay to perfect them.

Recommendations—Parks

The following recommendations are made for a comprehensive park, parkway and playground system. Drawings Nos. 9 and 21, show the locations chosen:

(1) Rockcliffe Park to be extended and the ridge north of the quarries acquired.

(2) A park adjoining the Rideau River and the Hurdman's Bridge on property now owned by the city.

(3) The development of Dow's Lake as a recreational centre and its improvement by a revision of the shore line and the construction there of frontage for motor and pleasure boats, and its connection with the Experimental Farm; also the connecting of Dow's Lake with Brown's Inlet by means of a canal to allow circulation of water. This is mainly on private property.

(4) The construction of a park at the bluff at Irving Avenue and the Grand Trunk Railway, and on the lower land. This is at present private property.

(5) A park between the Canadian Pacific Railway and the Ottawa River west of the city, facing Bate Island and Remic Rapids. This is the area suggested by Frederick G. Todd in his report on the "Ottawa Park System." This is at present private property.

(6) Lemieux Island, now owned by the Government.

(7) The land north and west of Bronson Avenue and Wellington Street, at the foot of the cliff on the Ottawa River. This is at present private property.

(8) Additional area at the Experimental Farm. Under no conditions whatever should the ground now occupied by the Experimental Farm be used for other than park purposes, should its present use as a farm be abandoned.

(9) The acquisition of Kettle and Duck Islands as park areas; at present private property.

(10) A park in Hull, on the Ottawa River, between the Gatineau River and Brewery Creek.

(11) Parks in Hull between Laurier Avenue and the Ottawa River.

(12) A park beyond the Chelsea Road, northwest of Hull. This area is now private property.

(13) The improvement as park or recreational areas of portions of Victoria and Philemon Islands, at present private property.

Parkways

To connect in one system the parks outlined in these recommendations, and also to connect them with the public buildings, the following parkways are recommended:

(1) A parkway leading from the Parliament Buildings along the west side of the Rideau Canal to Cartier Square, thence along the canal direct to the Exhibition Grounds and the Experimental Farm. Part of this exists at present. What is suggested is an extension.

(2) A parkway approximately parallel with Bronson Avenue, connecting the Experimental Farm with Wellington Street at Bronson Avenue. This would be new.

(3) Extensions and improvement as parkways of Lady Grey Drive and part of Sussex Street, connecting the Parliament Buildings, Rideau Hall Grounds, and Rockcliffe Park.

(4) Parkways beginning at Edwards' Mill and extending along each side of the Rideau River into the open country beyond the Hogsback. This is all new.

(5) A cross-town parkway replacing the Grand Trunk cross-town line, extending from the Rideau River to beyond the western limits of the city. This is all new.

(6) A parkway one or two blocks west of Preston Street connecting with Somerset Street. This will occupy property now used by the railways, which will be abandoned when the suggested railway scheme is carried out.

(7) A parkway along Green's Creek, from the Ottawa River to Walkley Road.

(8) A diagonal parkway running southeasterly from the Deschenes Rapids to the Merivale Road, then sweeping easterly to the Rideau River.

(9) A new riverside parkway along the Ottawa River in Hull.

(10) A new parkway from the Hull City Hall along Laval Street to the proposed passenger station.

(11) New parkways along Brewery Creek and along the Gatineau River.

Playgrounds

The following playgrounds are recommended:

Six playgrounds east of the Rideau River and north of the proposed industrial district.

Ten playgrounds and small parks east and south of the Rideau River and south of the proposed industrial area.

Six small parks and playgrounds between the Rideau and Ottawa Rivers north of the Experimental Farm and east of Holland Avenue.

Three playgrounds west of Holland Avenue and north of Carling Avenue.

Eight playgrounds and small parks west of the Rideau River and the Experimental Farm, and south of Carling Avenue.

Five playgrounds east of the Gatineau River and north of the Ottawa River.

Eight playgrounds and small parks including Flora Lake in Hull and in the outlying platted area of that city.

All the above is largely vacant property at present. These playground areas should be laid out in advance of the platting of the areas, where they occur in districts not already developed, and they should be purchased at a time when their cost will be at a minimum.

There are a number of places on the high ground surrounding Ottawa, where fine views of the cities and Parliament Buildings are afforded. These points should be developed as small park areas. They are shown on the drawing, and among the more important are:

Hill-top on Bronson Avenue extended, about two miles south of the Rideau River.

One on the Buchan Farm Road.

One on the Montreal Road near the stone quarries.

One in Hull on the Chelsea Road near the Toll Gate.

Present Parks

At present, there are in Ottawa, including the Exhibition Grounds, 850 acres of parks and parkways. In addition to this, there is the Experimental Farm, which is a semi-public park of 400 acres. There are also 190 acres of undeveloped public lands scattered throughout the cities, available for parks, parkways and playgrounds, of which at present no park use is made. These areas do not include land used as sites for public buildings such as Parliament Hill and Rideau Hall Grounds.

Park Acreage

In Hull there are no developed parks, parkways or playgrounds.

The parks, parkways and public lands in Ottawa are in detail as shown on the following table:—

Rockcliffe Park	620 acres.
Major Hill Park	60 "
Cartier Square	16 "
Strathcona Park	18 "
Exhibition Grounds	54 "
Other parks and parkways including the canal drive	82 "
	850 "
Experimental Farm	400 "
Undeveloped public lands available for additions to existing parks or as new parks, parkways and playgrounds	190 "
Total	1,440 acres.

The additional park areas recommended are as shown in the following table:—

Kettle and Upper and Lower Duck Islands (about)	700 acres.
Park on the Ottawa River at Remic Rapids	120 "
Addition to Rockcliffe Park (about)	125 "
Addition to Experimental Farm	20 "
Park in Hull on the Ottawa River, between the Gatineau River and Brewery Creek	100 "
Parks in Hull, between Laurier Avenue and the Ottawa River	40 "
Park north west of Hull, beyond Chelsea Road	180 "
Six playgrounds east of the Rideau River and north of the proposed industrial area	70 "
Ten playgrounds east of the Rideau River and south of the proposed industrial area	80 "
Six playgrounds between the Rideau and Ottawa Rivers, north of the Experimental Farm and east of Holland Ave.	30 "
Three playgrounds west of Holland Avenue and north of Carling Avenue	35 "
Eight playgrounds west of the Rideau River and the Experimental Farm, and south of Carling Avenue	80 acres.
Five playgrounds east of the Gatineau and north of the Ottawa River	40 "
Eight playgrounds in Hull and the outlying proposed platted area—including Flora Lake	100 "
Total (about)	1,720 "

The total acreage of parks and playgrounds, which Ottawa and Hull will possess under this plan, will be as shown in the following table:—

Existing Parks	850 acres.
Land owned, but not developed for park purposes, Experimental Farm and vacant area	590 "
Recommended additional areas for parks and playgrounds	1,720 "
Total	3,160 "

This total, as stated above, will be necessary for a population of 350,000 people.

The mileage of parkways existing and proposed as shown on Drawings No. 9 and 21 is as follows:—

	At Present	As Proposed
Parkways and Boulevards—		
Of Ottawa	3½ sq. miles	10 sq. miles
Of Hull	nil	1 sq. mile
Waterfront Parkways—		
Ottawa	10½ sq. miles	28½ sq. miles
Hull	nil	17½ sq. miles

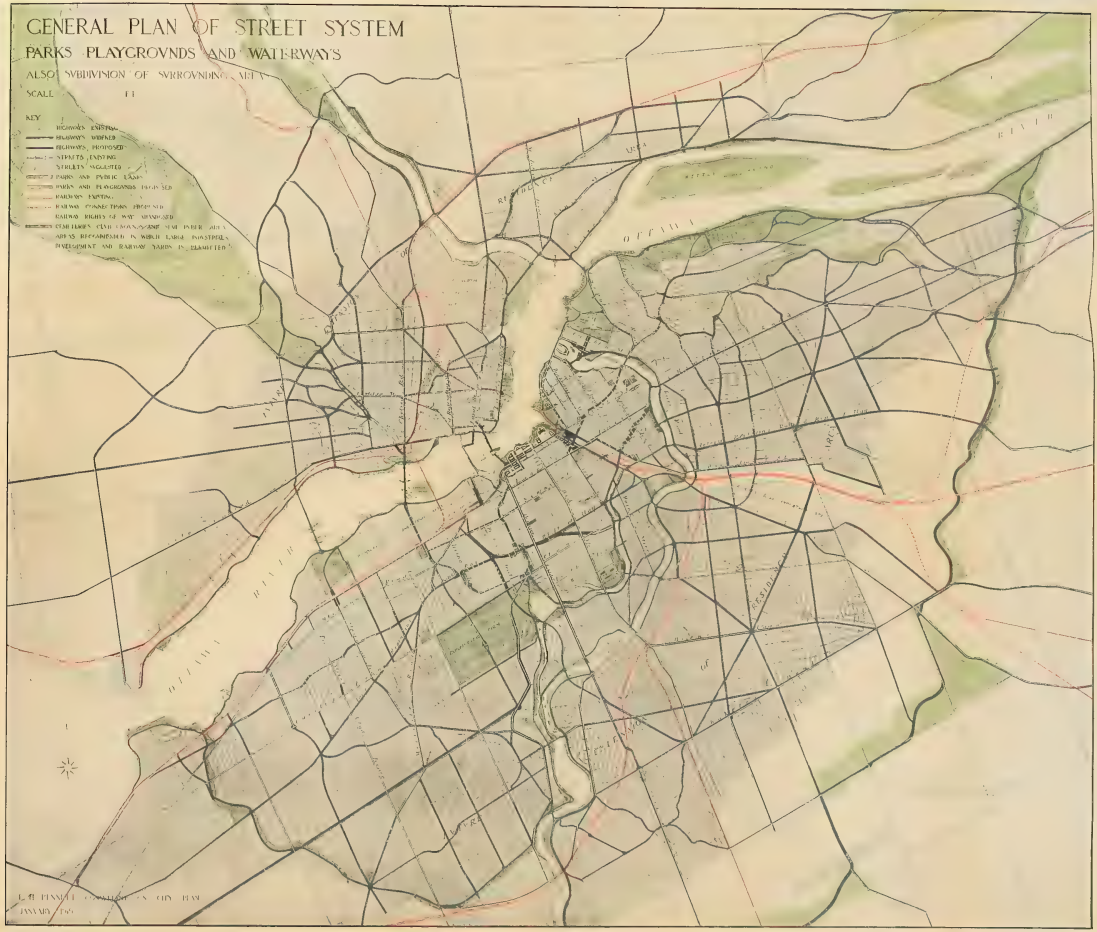
This system of parks, parkways and playgrounds, will require careful attention on the part of the authorities, and adjustment from time to time as the conditions surrounding the areas change. The areas should be acquired in advance of the development of the city and before prices for the land become prohibitive. The natural advantages of different areas should be maintained as far as possible.

It is only by such care, attention and foresight that any kind of comprehensive system can be carried out successfully.

It is very strongly recommended, in addition to the above, that a tract of, at least, a thousand acres be acquired in the high, well-wooded district lying some distance to the south west of the Experimental Farm. It is at present principally farm and bush land and ought to be obtained at very reasonable cost. Beyond its acquisition, nothing need be done with it at present, but as the city grows and develops some such area will without doubt be found necessary. To buy it now will involve only a bagatelle; to acquire it later will probably be impossible.

DRAWING No. 21

General Plan of Street System, Parks, Playgrounds and Waterways, also Subdivision of Surrounding Areas.



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JANUARY 1915

WATER TRANSPORTATION

Water Transportation involves several serious problems:

Problem

(1) The consideration of the Ottawa River and the Rideau Canal routes in their economic relations to the conditions as existing in the cities of Ottawa and Hull.

(2) The probable expansion of the trade routes of the Ottawa River and Rideau Canal, with its consequent effect on the expansive growth of the two cities.

(3) The relation of the above water routes to the physical development of the two cities.

(4) The establishment of a general policy to be followed in the development of water facilities in the cities of Ottawa and Hull as follows:

(a) One which will allow of the most economical handling of water borne business to the cities and its most economical distribution in the cities.

(b) One which will disturb the existing water terminals as little as possible and at the same time not prove a physical detriment to the city.

General Situation and Routes

The two water routes which centre in Ottawa and Hull have an important relation to the transportation facilities of the cities. At present about 10% of the total freight consumed or originating in Ottawa and Hull, is carried to the city either along the Ottawa River or along the Rideau Canal. They are used more, however, for the import of raw industrial materials than for the export of finished products.

Of the two routes, the Ottawa River is the more important. It connects Ottawa and Hull with the Atlantic Seaboard, with the New York State Canals and with the Great Lakes by way of the St. Lawrence River. It has an effective draft of about nine feet and compares very well in this respect with the New York State Barge Canal from Buffalo to New York City. The Rideau Canal on the other hand makes but one connection, that with the Great Lakes. It has a draft of only five feet over the lock sills.

Ottawa River Route.

The Ottawa River route to the Great Lakes is being chosen in preference to the route along the Rideau Canal, in spite of the fact that it is many miles

longer. The choice is made for the reason that its larger draught makes possible the use of barges and steamers of much greater capacity. This advantage considerably reduces the cost of transportation.

An indication of the greater importance of the Ottawa River route, compared with the Rideau Canal route, lies in the fact that it carries 77% of the total Ottawa and Hull water tonnage. It carries 71% of the incoming and 96% of the outgoing freight. These percentages are on the basis of freight destined to, or originating in, Ottawa and Hull, and do not allow for the through freight between the Ottawa River and the Canal, which is 1.6% of the total freight using the river and canal at Ottawa. It is true that a portion of the freight, which reaches Ottawa by way of the Ottawa River, uses the section of the canal between the Ottawa River and the Canal Basin where the dockage of the central business section of the city is situated, but with the exception of this one-half mile, its journey is taken over the Ottawa River. It is unfortunate that this dockage of the city is so placed that this is necessary, since the size of the boat in use has to conform with the shallow depth of the canal rather than with the deep one of the river.

Traffic

As stated above, and as illustrated in Drawing No. 22, the Ottawa River handles 76% of the total water commerce of Ottawa and Hull. The total amount of freight which came up or went down the river from the community in 1913 was 178,968 tons. Of this tonnage 90,556 tons, or about 51%, used the Rideau Canal as far as the Canal Basin. 65% of this tonnage was the product of mines and 20% the product of the forest. Of this 90,556 tons, about 3,713 tons was through freight, and passed beyond the Canal Basin to the Rideau River.

The remainder of the tonnage, 88,412 tons, was distributed along the Ottawa River shore front, a large amount of it coming from or going to the neighbourhood of the Chaudiere. Almost the whole of this tonnage was the product of mines or forests and requires much wharfage.

The passenger business on the Ottawa River at Ottawa and Hull is at present very small, and consists of a ferry service between Edwards' Dock, at the foot of Crichton Street, and Gatineau Point, and one steamer per day to and from Thurso, landing at Queen's Wharf. The Ottawa Boat Club, situated along this waterfront, deserves, however, consideration in this connection. No development which may be suggested should in any way interfere with the pleasure facilities now in use or proposed for the future by organizations such as this.

The detailed figures available, showing the past increase of water borne transportation on the Ottawa River, are of such a nature that it is hardly

possible to arrive at any estimate of future business. Provision is made in the plans, however, in connection with the proposed industrial districts, for a large increase in wharfage facilities.

Terminal Facilities

At present, the Ottawa River can hardly be said to have adequate and satisfactory public terminal facilities. With the exception of Queen's Wharf at the end of Sussex Street, of the small public dock at the Alexandra Bridge in Hull and the privately owned wharfage around the Chaudiere, the shore fronts of Ottawa and Hull are put to indiscriminate use and are lacking in order and arrangement.

It is proposed to establish the publicly owned and used dock on Victoria Island, as has already been suggested by the Public Works Department of the Government. The privately owned waterfront, on each side of the Ottawa River fronting Victoria Island, should be developed in the same way and made available for other concerns as well as for the present owners. This dock development, however, must in no way interfere with the water power facilities by encroaching on the tail-races of the power units. These docks should have facilities for the loading, unloading and storing of bulk raw materials.

Steps should be taken to induce the large industrial concerns, holding river frontage, to develop and carry out this plan for the orderly arrangement of their private facilities, and for the leasing of portions of the privately owned water front to other industrial concerns which desire such accommodation. If this is found impracticable the other solution is by means of expropriation and control by the authorities.

There is indicated on the plans a railway connection, from the proposed railway terminal and industrial district west of Broad Street into this dockage area. This should be furnished for the purpose of adding flexibility to the water terminal.

If only the tonnage which is at present distributed from Ottawa River be provided for, there will be necessary from 1,300 to 1,500 feet of wharf frontage, with a strip of about 200 feet in depth immediately back of it. If the tonnage which is brought up the Ottawa river and distributed from the Canal Basin be distributed from the Chaudiere District, there should be provided a total of 2,500 to 3,000 lineal feet of dock frontage.

The present dock in Hull at the Alexandra Bridge should be left as it is for the use of the general package freight. On the Ottawa side of the River, the dock between Nepean Point and the Rideau Falls should be improved for this same purpose.

Other Uses of River

Attention is called to the large use made of the river and water front at the City of Detroit. By the improvement of Belle Isle Park as an attractive

and healthful play spot for the city, there has been induced a tremendous volume of boat travel between the City of Detroit and the Island. At Toronto, somewhat similar conditions exist. Both of these are notable exceptions on this continent.

Should it be decided at any time to develop Kettle and Duck Islands as park or pleasure places, a line of steamers or ferries could be put in operation connecting with Hull and Ottawa. If possible, the wharves for this service should be given direct street car connection, or at least be arranged so as to be immediately accessible to the car lines. The most central place in Hull for a wharf to handle traffic of this kind is undoubtedly around the Alexandra Bridge. For Ottawa, the most central point would be adjacent to the foot of the canal locks. Another desirable location for a dock of this kind would be on Victoria Island.

With the development of the industrial area in Hull around Leamy Lake, and in Ottawa to the west of Mechanicsville, it would be desirable to give each of these areas water connections. It is proposed, therefore, in filling Leamy Lake and in relocating Brewery Creek, so to develop the channels that wharfage and an adequate turning basin shall be provided for the industrial district centreing there, and also that as much of the Gatineau as is developed industrially be provided with wharfage.

If it is desired to connect this water area of the Hull industrial district with the Ottawa River above the Chaudiere Falls, a canal of nine foot draught on about the present location of Brewery Creek may be constructed, provided the Georgian Bay Canal is not constructed. A large section of the proposed industrial area of West Ottawa would then have direct water connection with the Great Lakes and the Atlantic Seaboard. Provision is made in the plans for the improvement of about 4,000 lineal feet of water front and the reclamation of about 70 acres of land, in the Mechanicsville district above the Chaudiere Falls.

Rideau Canal, its Relation to City.

Apart from its desirability as a water traffic artery, the Rideau Canal is closely bound up with the problem of the proper physical development of the city. It has furthermore a great historical interest, and a strong sentiment exists concerning it. As it stands, however, it has always been a barrier to expansion in an easterly, southeasterly and southerly direction. Existing requirements for navigation purposes render the provision of street crossings a physical and financial burden.

In the business district from Wellington Street to Laurier Avenue, a distance of over one-quarter of a mile, there is no crossing. From Laurier Avenue to Argyle Avenue, a distance of nearly a mile, there is no crossing.

From Argyle Avenue to Bank Street, a distance of about one and one-half miles, there is no crossing.

The requirements established by the Government for the purpose of navigation have demanded that all fixed bridges crossing the canal shall provide a clearance of 30 feet above the water. This has necessitated long and expensive approaches at Bank Street and at Laurier Avenue, and moveable bridges at Bronson and Argyle Avenues, which, if they were reconstructed to take care of street car traffic, would be expensive.

The canal as it stands permits of unrestricted riparian development on all property which is not immediately developed by the Government or City authorities, including property leased from the Government. The presence of good building sand up the Rideau River has brought about the use of the Canal Basin for distributing and storing such material, and of one or two sections of the canal for brick-making industry. The proximity of the lumber storage areas to Dow's Lake has also led to the use of a large portion of this water frontage for this purpose.

In order to determine the best means of harmonizing the necessities of the city for expansion, and at the same time to retain for the city the value of the canal as a freight carrying artery, it is necessary to analyse such statistics of freight and passenger traffic as are available and to determine if possible the economical and recreational value of the canal.

Freight Traffic

While there has not been a regular increase in the volume of freight traffic on the Rideau Canal, the traffic for 1913 was about twice as heavy as the traffic of 1887. From 1887 to 1890, there was an increase from 90,000 tons to 113,000. From 1890 to 1902, there was a steady decrease, until in 1902 the canal was carrying about half as much freight as it did in 1890. From 1902 until the present time, there has been a consistent increase of freight carried and in 1913, the total freight traffic on the canal amounted to 171,223 tons. (See Drawing No. 22).

It is interesting to analyse this total traffic of 171,223 tons. Investigation in the office of statistics of the canal shows that, of the total amount of tonnage on the canal, 141,162 tons, or 82.4%, was destined for or shipped from or passed through the Ottawa Canal Basin and that 30,061 tons of it did not touch Ottawa. Analysis of this 141,162 tons indicates that 3,713 tons, or 2.6%, passed through Ottawa between the Ottawa River and the Rideau River, and that 137,449 tons, or 97.4%, was shipped from or received in Ottawa. Stating these figures in terms of the whole traffic, 82.4% passed through Ottawa and 17.6% did not touch Ottawa at all; 80.2% originated or was delivered at Ottawa and 2.2% passed from one side of Ottawa to the other.

Of the Ottawa tonnage 86,843 tons, or 63.3%, used only the section of the canal from the Basin to the Ottawa River, and 50,606 tons, or 36.7%, used only the section from the Basin to the Rideau River.

It is interesting to note that, of the 90,556 tons which passed between the Ottawa River and the Canal Basin, at least 56,000 tons, or 62%, were the product of mines, and that 18,500, or 20%, were the product of forests, and of the 54,319 tons which passed between the Canal Basin and the Rideau River that at least 49,000, or 90%, were the product of mines and forests, largely the former. In other words, the total tonnage handled at the Canal Basin consists almost entirely of barge freight, i.e., lumber, coal, sand, clay, and other mineral products. A further analysis shows that, of other than barge freight, not more than 5,000 tons passed through or under the bridges between Laurier Avenue and the Hogsback Locks. Only 10% was agricultural and package freight.

Passenger Traffic

The passenger traffic on the canal maintained a more or less constant yearly figure from 1887 to 1901. From 6,000 passengers in 1901, travel increased to about 28,000 in 1906. The number of passengers decreased to about 20,000 in 1909, increasing in 1910 and decreasing in 1912 to about 21,000. In 1913, the number of passengers was between 19,000 and 20,000, of which 11.6% were passengers who came to and from Ottawa. (See Drawing No. 22). It may be said that these figures apply only to passengers carried by transportation companies and did not apply to use of the canal by privately owned boats. Practically no traffic passed between the Canal Basin and the Ottawa River.

Relation of Traffic to Bridges

This small amount of passenger travel on the canal can hardly in itself be said to warrant a large expense in high level bridges. Nor is it important enough to be an inconvenience and obstacle to the physical growth of the city. Especially would this be the case, if it were possible to handle it at any other point on the canal accessible to a transportation line.

The total number of lockages through the Ottawa River Locks for the year 1913 were 1,323. Of this number 814 were steamers, and 230 barges and floats. The remainder, 279, were pleasure boats. This would indicate that of the traffic through the Ottawa River Locks 79% were commerce ships and 21% were pleasure boats privately owned.

At the other end of the Ottawa stretch of the canal, the total number of boats passing through the Hartwell Locks in 1913 was 3,917. Of this number 1,163 were steamers, barges and floats, that is, 30% were commerce and passenger ships. The remaining 2,754, or 70%, were pleasure boats privately owned. Of this 2,754, about 2,695 were motor boats.

There are only about one-tenth the number of pleasure boats, desiring to transfer from the Ottawa River to the Canal, that there are going from the canal to the upper stretch of the Rideau River.

The commercial steamers which travel on the canal need considerable head room, barges requiring from 8 to 10 feet and motor boats usually not more than 6 feet.

Counts were taken at the Grand Trunk Bridge on the Canada Atlantic cross-town line during the month of June, 1914. These counts show that this bridge was opened 134 times. During the same period the number of lockages at the Ottawa River was 192, of which 139 were for steamers. At Hartwell Locks the total number of lockages was 653, of this number 141 being for steamers. While there is no absolute relation between these figures and the number of openings at the Grand Trunk Bridge, the number of openings themselves is more or less indicative of the character of the boats requiring high clearance.

From these figures it would appear that the high level bridges are necessary mainly for the commercial steamers, if not entirely so. The use of the canal for pleasure purposes has little bearing on the question of bridge clearance, whereas it has an important place in the life of Ottawa. Above the Basin, this is the principal use to which the canal is put.

Conclusions

From the above analyses the following definite statements may be made regarding freight traffic:—

(1) That for the purpose of study the Ottawa section of the Canal may be divided into two parts:—

(a) From the Ottawa River to Laurier Avenue.

(b) From Laurier Avenue to the Rideau River.

(2) That the through traffic from the Ottawa River to the Rideau River is a negligible part of the whole traffic.

(3) That the Canal Basin is more of a terminal for Ottawa River traffic than for Rideau Canal traffic.

(4) That the bulk of the tonnage at the Canal Basin is of such a nature that it should be handled at some point other than in the down-town business district of the city. It requires much more wharfage per ton than does package freight.

(5) That, inasmuch as most of this bulk commodity is carried in barges towed by tugs or in self-propelling barges, it would be an easy matter to require the employment of tugs of low head-room.

(6) That the real difficulty in revising the regulations as to headroom, and the establishment of low (level) clearance bridges of a fixed type, lies, therefore, in providing new dockage for the package freight and passenger boats. It is suggested that a freight passenger terminal be located at Dow's Lake, which with proper street railway facilities and paved streets would impose no hardship on either the passenger or commercial interests. If this be done, the requirement of high clearance bridges is not warranted. Only about 10% of the water tonnage is package freight or agricultural produce, and this amount is 0.75% of the total freight handled in Ottawa.

Suggestions Previously made for Improvement

Several suggestions have been made for improving the physical relation of the city and canal. These have taken the form of the abandonment of the canal from the Ottawa River to the Rideau River, or of the abandonment of the whole canal. It has also been suggested that the streets be carried over the canal by low fixed or moveable bridges.

In connection with the suggestion for abandonment of the canal bed for navigation purposes, there have been suggestions that it be used as the railway entrance; that it be used for rapid transit purposes; and also that it be moved to a new location.

The abandonment of the canal is unnecessary and would in our judgment result in real harm to the city. While we cannot contend that it is an absolute necessity for commercial purposes, it certainly has a recreational and historical value. Also its removal would be a great loss to the physical aspect of the city. This is especially true with respect to first impressions on entering the city by rail from the east.

With regard to the uses of the old canal bed for rapid transit, Ottawa will not be ready, for very many years to come, for rapid transit facilities in the strict sense of that term. Regarding its use for railway right-of-way, the benefits arising would not, in our judgment, justify its loss to the city as a place of recreation.

With respect to the suggestion of its construction in some new location convenient for commercial purposes, and in no way a detriment to the physical development of Ottawa, it can hardly be maintained that the cost of such an improvement would be justified by the commercial purpose to which the canal would be put. It is felt that the canal has a distinct value other than commercial in its present location, and that if it were in any other, much of this would be lost.

RECOMMENDATIONS

The following recommendations are made:

Location

(1) That the canal be retained in its present location.

Bridge Clearance

(2) That the suggestion for low clearance fixed bridges be followed, and that this clearance be about 12 feet above the water level. This will necessitate a change in the Government requirements for navigation purposes. All business which has to pass through the city proper would then be carried in craft of low headroom. It is felt that there is not enough traffic passing through the down-town section, requiring other than low clearance, to warrant the present requirement for overhead clearance of 30 feet.

With regard to the section of the canal from Gladstone Avenue to Dow's Lake, it is felt that the amount of traffic requiring high clearance is not sufficient to justify the evil physical effect on the city of high level bridges with long ramps; neither is the expense of such bridges justified. If it is found that no adjustment can be made of this matter which will permit of low fixed bridges, then low clearance moveable bridges should be resorted to. In this case the cost of maintenance and their physical appearance will have to be considered.

Public Docks

(3) That the use of dock frontage north of Laurier Avenue be abandoned, and that the mineral and lumber products be distributed from a point adjacent to Gladstone Avenue and from the vicinity of Dow's Lake. The use of property in the down-town district for storing sand, coal and lumber cannot be defended on economic grounds; neither can it be claimed that it improves the appearance of the down-town district. The use of property adjacent to Gladstone Avenue will permit of a connection between rail and water and with the suggested industrial area to the east.

The wharves should be equipped with handling machinery and should have a storage area about 200 feet wide back of them.

It is recommended that passenger landings be established in the vicinity of Dow's Lake.

Uses of Canal Banks

(4) That no more industrial development be permitted to take place along the banks of the canal between the Rideau River and the Ottawa River, and that as soon as possible such industries as now

exist on this stretch of the canal be removed to other convenient locations.

Use of Canal

(5) That the canal be developed to its utmost as affording recreational facilities within the city. It is most probable that as time goes on and the city develops, the canal will be used more and more by pleasure craft.

DRAWING No. 22

1. Diagram showing Volume and Distribution of Freight Traffic on Rideau Canal and Ottawa River in and out of Ottawa for year 1913.

2. Curve showing Growth of Freight Traffic on Rideau Canal since year 1887.

3. Curve showing Growth of Passenger Traffic on Rideau Canal since year 1887.

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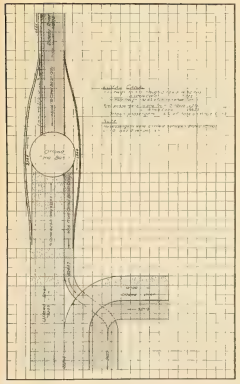
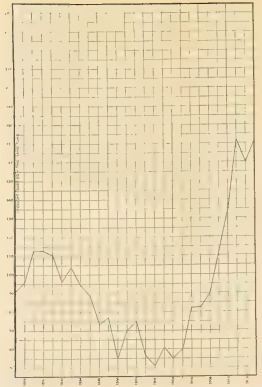
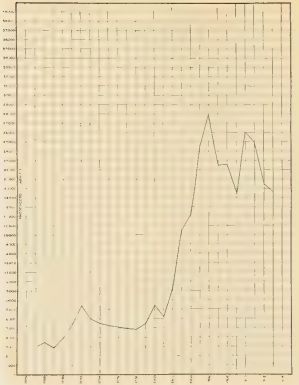


DIAGRAM SHOWING VOLUME AND DISTRIBUTION OF FREIGHT TRAFFIC ON RIDEAU CANAL AND OTTAWA RIVER IN AND OUT OF OTTAWA FOR YEAR 1913 · SCALE TONS.



CURVE SHOWING GROWTH OF FREIGHT TRAFFIC ON RIDEAU CANAL SINCE YEAR 1887.



CURVE SHOWING GROWTH OF PASSENGER TRAFFIC ON RIDEAU CANAL SINCE YEAR 1887.

STREET RAILWAY AND OTHER UTILITIES

Considerations Underlying Study

The general considerations underlying the relation of transportation to a city are:

(1) The proper distribution of population.

(2) The provision of adequate and comfortable service to all parts of a city, within the limits of reasonable economic operation.

(3) The reduction of congestion in the streets to a minimum.

(4) The relations between the city and the street car company.

Relation of Transportation to City

The inter-relation of all public utilities with the life of a city is fundamental to the study of its development. This is nowhere brought out more strongly than in the case of the transportation utility. A glance at the map of any city on which the transportation lines, the density of population, and the distribution of the buildings are shown, makes this very clear. It is the transportation system which either concentrates or spreads the population. It controls the business development, and it makes the life of the city easy to bear or strangles it.

It has been claimed that the cure for bad housing conditions lies in properly distributed transportation facilities. This phase of the question should be given very serious consideration in the study and development of any transportation system. It is undoubtedly true, for instance, that the practice often followed, of attempting to relieve congestion along a transportation line outside of the central district, by parallelling the existing line with a new one, only aggravates the situation. The added facility only leads to the further concentration of population close to the line of transportation.

In many cities, it has been the policy of transportation companies to demand this concentration of their business. The street railway companies generally object to constructing a new line into an undeveloped territory, profit from which is not yet in sight. Few cities have, in the past, been in the position to demand that the companies build new lines into unoccupied areas.

In claiming that in the proper development of the transportation system

lie means of bringing about housing reform, the advocates base their arguments on the fact that a transportation line, thrown out into a new territory, will provide new areas for residence, and that the old area will then have competition, and will be forced, in order to hold its own,to provide better housing facilities. While this must be modified in its application, especially in the larger cities where the distance to be travelled has a great influence on account of the time consumed, it is generally true of the smaller ones.

That a new area, reasonably close to the city, can be opened up by transportation, has been shown to be possible, and it is not necessary that this line of transportation should be a rapid transit line, provided the distance is not too great. A wide use of this principle lies in its application in different cities to housing in its broader sense or to the general distribution of population.

One of the laws of the growth of cities is that the centre of business activity always lies close to the centre of distribution of transportation. General business wishes to be at a point where it can be reached by the greatest number of people, and the movement towards a common centre, determined first by business, is later firmly established by the transportation development. Transportation lines continue to be added, until the business centre and the centre of distribution of transportation become one and the same. Once well started, this nucleus of activity cannot be broken up except by means which would bring about its ruin. All that it is possible to do is to take it in time, and look far enough ahead, so that proper means can be taken towards mitigating the ultimate unavoidable congestion.

Those who first laid out our cities, did not anticipate tall office buildings, which make possible the concentration of a large number of workers in a small area. Boston, London, Paris, New York, and Philadelphia are meeting the problem of the resulting congestion by the construction of transportation subway systems under the heart of the business centre. Chicago is proposing to do the same thing.

Negotiations and plans, looking to the avoidance of congestion, are necessary in almost every city. It takes many years to develop a satisfactory plan, and during that time the street car business has grown to large proportions. When congestion has once started, most of the attention is necessarily spent in meeting the immediate obligations of traffic.

Some cities are pursuing a policy of constructing subways which they rent to a transportation company. Others again are paying for the widening of the streets without charge to the transportation company. There is involved in these policies a double obligation. The street car company could not be allowed to move its street cars to another location, and at the

same time the city cannot submit to the inconvenience of having a street rendered permanently useless for traffic other than street cars.

Share in Obligations

The relations of a municipality with the public service corporation providing transportation present many complexities such as the above, when the attempt is made to arrive at what is a fair basis for negotiations and intercourse. There are undoubtedly mutual benefits and mutual obligations.

In laying out the extensions of lines into the outlying areas, it has been suggested that the car companies should take a portion of the bad with the good, and should assist in that way in spreading the area of the city, and should not be allowed to pursue a policy of concentration which will lead later to congestion and slum conditions. Another method for extension, now receiving much careful consideration, is to have the street railway company pay only part of the cost of these extensions, the balance of the cost to be provided for by assessment against the properties benefited by them.

Present Situation in Ottawa

In Ottawa, the Bank Street line, the Experimental Farm line, and the Britannia line have done much towards distributing the city's population. So also has the line to the Rifle Ranges, the line running up from Hull to the Chelsea Road, and also the line towards Aylmer. These lines are having a beneficial effect on the growth of the city.

The effect of the Britannia line is apparent in the large number of subdivisions which are being laid out to the west of the city. The effect of the Rifle Range line is apparent in the subdivision being laid out adjoining Rockcliffe. This is true also of the line running up the Chelsea Road.

Many of the subdivisions appear to be independent of the present street car facilities, but it is nevertheless a fact that the real estate activity immediately adjoining the Britannia line, and the Bank Street line, has an influence for a considerable distance away. Projected lines are discounted long before they are built.

The influence of the transportation system in moulding the business centre of Ottawa needs no discussion. On the east, the Sussex Street line, the Rideau Street line and the Elgin Street line, together with the line from the Alexandra bridge to Hull, all focus in the vicinity of the Plaza bridge. On the west, the Bank Street line, the Somerset Street line, the Gladstone Street line, the Britannia line and the line to Broad Street and to Hull, all focus at about Bank and Sparks Streets. All the cars which run into the city, with the exception of those on the Experimental Farm line, and the

cars over the Alexandra bridge to Hull, pass backwards and forwards between these two foci.

When the city was young and the business district consisted of a few blocks, and street car facilities first became necessary, the natural course to pursue was to run the car lines from the down-town business district towards the then residence district. As the city grew, other lines were added focusing as before in the business district.

The first-class business of the city has consequently become entrenched in the area which is most accessible to all parts of the city, namely, adjacent to the axis joining the east focus to the west focus. From the solid business centre, projections of business are following the routes of transportation. These projections are the result of the presence of the car lines on these streets.

Congestion on Sparks St

The concentration of traffic between the two transportation foci, connected by Sparks Street, has led to a form of street congestion in Ottawa, which can find little or no relief except in the removal of the car line from the street. This point is discussed later, but at this time it is desired to call attention to this fact, on account of the danger to pedestrians from such a condition in the street, and the rendering useless of such a street for ordinary traffic purposes. See Drawing No. 24.

In Ottawa, the number of street cars using the streets at present would not point to any extreme congestion, were it not that Sparks Street, on which most of them operate in the down-town district, is too narrow for all the purposes which it is called upon to serve. Through the neck of Sparks Street, there are passed at present 79% of the cars which operate from Sussex Street to Bank Street. Sparks Street has a narrow width, and it is evident that in order to make this street of use for purposes other than as a right-of-way for street cars, some change in the present arrangement will in future have to be made.

Growth of Traffic

In 1892, the number of revenue passengers carried on the street railway of Ottawa was 1,520,000. In 1913, the number of passengers carried was practically 24,000,000. At the earlier date, the population of the city was about 44,000 and at the latter date the population served was between 96,000 and 100,000. During this period of 21 years, therefore, the street car travel has increased sixteen times, while the population has increased about two and one-quarter times. In New York City, while the population doubled, the traffic increased eight or nine times; in Chicago, while the population doubled, the street car business increased eight or nine times. It is an almost universal phenomenon in large or small cities that the street car traffic

and the so-called riding habit per capita has increased with tremendous strides, and at a rate much greater than that of population.

The development of the outlying areas of a city for residential purposes has been the principal factor in bringing about the tremendous increase in street car passengers, although it is true that the actual habit of riding has also become greater.

This past rate of growth is illustrated on Drawing No. 25, Plates I., II. and III. On these charts are curves for the total annual revenue rides, for the rides per capita, and for the number of people of the city's population represented by one daily ride. These last two curves, and especially the latter, lead to the belief that the tremendous growth of the past cannot be expected in the future. It will be seen on Plate III. that the rides per capita have a tendency to reach a constant figure irrespective of the size of the population.

If we examine the curve on Plate II., which is the curve of rides per capita plotted with respect to the population, we find that in 1892, when the population was 44,000, the rides per capita were 35, and in 1914, with the population close to 100,000, the rides per capita were about 240. In other words, the rides per capita have increased about seven times while the population has little more than doubled.

There has been worked out, by students of this subject, a "law of squares" for the increase of revenue passengers. This law of squares states that as the population of the city increases, the revenue rides increase as the square of the factor of increase of population. While this is undoubtedly true of certain specific periods of the development of traffic, it can hardly be projected for use in estimating the future revenue rides. For instance, when the population of Ottawa reaches the figure of 500,000 people, the rides per capita according to this law will have become 1,200 per annum; in other words, each person will ride about four times a day. This would mean that each inhabitant of the city would spend on the average two hours a day on the street car.

While this law is referred to in almost every report on the subject of transportation, it is recognized by most investigators that it gives figures for the future, which are considered to be much too large. The results, obtained by the law, have been modified according to the judgment of each enquirer.

In this report, the estimate of future street car traffic is based on projection of the two curves, one for the rides per capita and the other for the number of people per daily ride. These indicate that a riding habit of 400 rides per capita will be reached when the population is 200,000 to 250,000 people. This would mean that every individual in the city takes a little more than one ride per day.

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Compared with other cities, this figure is not a high one. In Pittsburgh, the rides per capita per year are slightly in excess of 400; in New York they are between 350 and 400; in Chicago they are 300. In each of these cities the population is, of course, much greater than the population estimated for Ottawa. There are some smaller cities, Winnipeg, New Haven and Toledo, which show a riding habit of over 300 rides per capita per year, with populations less than 200,000.

The figures, developed from this estimate of traffic growth for the future, indicate that when the City of Ottawa has a population of 150,000 people, the total annual revenue rides will approximate about 48,000,000; when the population has reached 200,000, the rides will be 76,000,000; when the population has reached 300,000, the rides will be approximately 120,000,000. As indicated above, in the light of past rates of growth of street car travel, these figures are conservative. In the table appended, the rides per capita for Ottawa are compared with the rides per capita in other cities on this continent. The riding habit for Hull cannot at this time be determined, on account of the nature of the system and of its relation to that of Ottawa.

Present Service

The general character of the street car travel in Ottawa is very similar in intensity, though not in distribution, to that in most of the cities on this continent. It is in the distribution into periods of the day that the difference lies. This difference is that which might be expected between small and large cities.

Observation of Plate IV., Drawing 25, showing the daily hourly travel for the whole system of Ottawa, will show that there are several periods of peak load. In most cities there are but two. In Ottawa, there is one inward in the morning, one outward between 11.30 a.m. and 1.0 p.m.; one inward between 12.30 and 2.30; one outward between 5.0 and 6.30; one inward between 7.0 and 8.30 and one outward after 10.0 o'clock. Analysis of the separate lines shows that this condition holds on almost every line in the city. The peak periods, which occur between 11.30 and 2.30 o'clock, are undoubtedly occasioned by workers in business, and in Government offices going home to lunch, which is unusual in a city of larger size.

Further investigation of Plate IV. will show that at present the street car companies in Ottawa and Hull are meeting the service demands in a very satisfactory manner. It will be seen that only occasionally do the passengers exceed the number of seats offered. This is true, not only of the system as a whole, but also of the individual lines. It is needless to say that this is a remarkable condition. In New York, the service rendered for peak load conditions is far behind the demand, on the elevated, on the sub-

way and on the street cars. In Brooklyn this is also the case. In Chicago, similar conditions hold, and the number of passengers exceed the supply of seats by 100 per cent. The same conditions are true of San Francisco, Toronto and Detroit. At the rush hour period in these cities, the congestion is very intense, and the cars in use cannot meet the demands placed upon them. The table inserted shows approximately this rush hour ratio for several cities.

RUSH HOUR RATIO SEATS TO PASSENGERS

Ottawa	1 : 1
Toronto	1 : 1.7
Chicago	1 : 2
New York	1 : 4
Pittsburgh	1 : 2
San Francisco	1 : 1.6
Milwaukee	1 : 2
Detroit	1 : 1.5

Present Situation in Hull

The city of Hull has hardly reached the point where it has need of a street car system to satisfy the demands of purely local travel. The facilities it has are more in the nature of connections with Ottawa, and a share in the interurban connections between Ottawa and Aylmer and the Chelsea road.

The daily travel between the two cities is quite heavy, and amounts to about 4,100 passengers in each direction, including the interurban traffic to Aylmer and the Chelsea Road line. In addition, there are about 2,900 foot passengers.

The two connections between the cities are operated by different companies and have at present no co-relation. One of them passing over the Victoria Bridge stops as soon as it reaches the north side of the River at Main Street. The other line passes over the Alexandra Bridge, round the outskirts of Hull as a belt line, and back to Ottawa. Over the Alexandra Bridge and along Main Street, pass also the cars from Ottawa to Aylmer and Chelsea Road.

Street congestion, due to presence of street cars, is in no way a serious question for Hull at present, except with respect to the approach to the Victoria Bridge at Main Street, which, in the morning and evening hours, is filled with workers.

RECOMMENDATIONS

(1) Extension of lines in outlying districts.

(2) Construction of subway in the down-town district.

(3) Unification of the Ottawa and Hull systems, on the basis of one fare and through operation.

(4) The adoption of centre pole construction for surface lines wherever possible.

Extension of Present System

Recommended extensions are shown on Drawing No. 19, Diagram "B." When proper connections between Ottawa and the district lying to the east across the Rideau River are opened up, one or more transportation lines should be run into the territory to the north and south of Eastview. In fact, at the present time, there would be little difficulty in giving this service. There is a large area available there for housing purposes, and all that its development requires is transportation. The authorities must see the necessity of such an extension.

The Elgin Street line should be carried southwards and southeastwards across the Canal and river. The Bank Street line should be extended due south. It is recommended that a line be carried along Bronson Avenue from the down-town section, out beyond the Rideau River. Another line should be developed along Carling Avenue, as a branch from this proposed Bronson Avenue line. The Broad Street line should be extended westwards through Mechanicsville.

As time goes on, the necessity for cross-town lines will become more apparent. There will be necessary a line, probably along Laurier Avenue, which will traverse the city from east to west without going into the crowded down-town centre. Another line running from east to west will become necessary farther out. To furnish this, it is recommended that the Gladstone Avenue line be moved south to the Boulevard which it is proposed will replace the present Grand Trunk cross-town line from Holland Avenue to the Rideau Canal. At Elgin Street, this line will turn back to Gladstone Avenue, extending across the Rideau River to the district east. These lines can serve as feeders to the main down-town trunk lines.

In Hull, the line on the Chelsea Road might be extended so as to connect the area lying round Leamy Lake with the cities. The same line should be extended southwards to Aylmer Road. The present line in Hull itself should be extended over Brewery Creek and beyond that over Lake Creek. As the areas lying along these suggested outer lines develop, branch lines

should be thrown off to spread still further the housing areas. The Chelsea Road line and the Aylmer line are in admirable positions to aid in the distribution of the growing population of Hull into the areas well situated for residential purposes, along the higher ground to the west of Brewery Creek.

The industrial area suggested for development in Hull must be connected with the comprehensive transportation system of Ottawa and Hull.

Extensions from the Aylmer and Chelsea Road lines should be carried to the Forest Reserve area to the north. An extension across the Gatineau and down the Ottawa River will become a convenience at a later date.

Relief to Down-Town Congestion

Means to operate cars faster through the down-town district are being sought in many cities. The end desired is that the round trip may be made in shorter time and the cars at present in use operated to do more work, with the increase in street congestion consequently obviated. This is being done in two ways,—first, by through-routing of all cars, that is, by the elimination of as many as possible of the down-town terminals and loops,—second, by the construction, through the congested district, of subways for street cars, through which the cars can move faster than they can on the streets. It may be remarked, however, that the second of these methods can be applied only after the first has been arranged for. It is interesting to note that Ottawa, except in its relation to Hull, already has the through-routing principle in operation, a condition existing in but few cities.

With the elimination of trucking from Wellington Street, in front of government property, more vehicular traffic will be developed on the east and west down-town streets. Sparks Street will have to bear a portion of this. It cannot do this unless moving vehicle space is provided, as well as space for standing vehicles. Sparks Street, with car tracks, is almost useless as a general traffic carrying street.

If all the cars were removed to Wellington Street, business interests would not be seriously affected, since the transportation lines would skirt the business centre. This course, however, would place in front of the government property and buildings a serious form of congestion. The occupying by street cars of a street, which should be reserved as an appendage to the Government centre, presents a form of nuisance which would not be desirable. A moderate use of this street,however, by street cars for Government employees would not be objectionable.

Even though at a later time, it may be necessary to use Laurier Avenue and the other streets for street cars, doing so at present cannot be entertained as an immediate means of increasing the capacity of Sparks Street.

The time required to pass through the business section of the city would not be appreciably decreased, and the cars would be too far removed from the business centre. Their removal would materially effect business interests. Furthermore, the routing of the cars at each end of the business centre would be extremely difficult.

Down-town Subway

A second method, and one which is recommended for adoption, is to place the street cars, from the Plaza Bridge to Bank Street and Bronson Avenue, in a covered subway. If this method were adopted, there would be no disturbance of business interests and of the shopping district. There would be no inconvenience to travel, and Sparks Street would be available as a traffic street. It virtually increases the width of Sparks Street by more than twenty feet, and its actual traffic capacity still more. A suggestion for the location of a subway and its connections is shown on Drawings Nos. 11 and 26.

The exact location of such a subway, whether under Sparks Street or Wellington Street, cannot be absolutely determined at this time. Wellington Street would present no interference with traffic and business during construction.

It is possible, however, to lay down the entrances to this subway. On the east the entrance should be at the Plaza Bridge; on the west at the foot of the cliff near the intersection of Sparks and Wellington Streets. Branches should be constructed on Elgin and Bank Streets, with entrances, in the former case, at Cartier Square, and in the latter, just south of Laurier Avenue.

The general obstacles in the way of this improvement are the rivalry between steam railway and canal interests, the connection with the Elgin Street line at the east, and the necessity for taking private property in order to connect with the Bank Street line at the west end.

The policy of adopting subway construction is for the purpose of freeing the streets in the down-town centre entirely of street car business. It is proposed that the transporation lines be brought to the perimeter of the central section of the city above ground, and there enter subways which shall extend across the heart of the city. This principle is being adopted universally to relieve congestion on narrow down-town streets.

A third method of increasing the capacity of Sparks Street is to widen it. This, however, is open to objections. It would disturb, for a considerable period of time, the established business along one side, and after it was effected, would not furnish the same capacity as might be had by the removal of the street cars. It would be costly in proportion to benefit received, and would furnish only temporary relief.

Development of Comprehensive System for Ottawa and Hull

Arrangements should be made for the through-routing of lines between the cities, and the development of a comprehensive system. The line over the Alexandra Bridge should be routed into the proposed subway at the Plaza, and the one over the Victoria Bridge should be routed around Hull. One fare should carry a passenger from any part of Hull to any part of Ottawa. The interurban cars, too, should be connected with the Ottawa system in a more flexible manner. These two transit connections between Ottawa and Hull, developed to their full capacity, will serve the needs for many years to come. They are fortunately situated at each end of the line of contact of the two cities.

A feature of the electrical operation of street cars, which is not generally given enough attention, is the presence of overhead wires on the streets. The common practice of suspending the trolley wires from transverse wires extending from sidewalk to sidewalk, and the placing of transmission wires along the streets is unsightly and often dangerous. There is obstruction to pedestrian travel on account of the supporting posts in the sidewalks, and this in crowded streets becomes a nuisance.

The subway, proposed for the use of street cars between the Grand Trunk station and Bank Street, will remove wires and poles from Sparks Street, Albert Street and Queen's Street, and from Elgin and Bank Streets as far as Laurier Avenue. Beyond these points centre pole trolleys should be put in use, and the transmission lines placed in galleries under the streets.

A thorough study of the present physical condition of the system is necessary, so that a fair point of view may be arrived at, from which to determine the financial burden which the street car company can reasonably be required to carry in the immediate future in making improvements. This is bound up with the franchise, the life and condition of the present plant and pavement, and with the putting under ground of telephone, light and power wires.

Reference is made elsewhere in this report to the desirability of a comprehensive underground conduit system for telegraph, telephone and power conduits, in fact, for all wiring, and it is referred to again at this point to call attention to its relation to the street car system.

Examination shows that considerable work will be required to be done, both in Ottawa and Hull, and expecially in Hull, in bettering in the near future the physical condition of the streets and tracks. This should be taken up by the authorities and a progressive program laid down in co-operation with all the utility companies.

RIDING HABIT IN VARIOUS CITIES

	Rides Per Capita	Population
Ottawa	240	100,000
Montreal	267	600,000
Toronto	343	445,600
Chicago, (St. Cars only)	320	2,300,000
Pittsburgh	410	533,000
San Francisco	240	416,000
Cleveland	260	560,600
Buffalo	230	423,700
Milwaukee	250	373,900
Detroit	300	465,800
Winnipeg	360	165,000
Syracuse	234	146,500
Bridgeport	192	102,700
New Haven	322	144,500
Toledo	360	184,126

OTHER UTILITIES

Sewage

It is recommended as a definite policy, that as soon as possible the practice of emptying untreated sewage into the waterways be abandoned. With the growth of the community, the present method of disposal cannot but become a greater nuisance, and prove detrimental to health, to the river-front property, and to the use of the waterways for recreational and bathing purposes.

It is not the purpose of this report to determine upon any definite method of treatment. The method, which may be adopted, should be such that the effluent into the waterways will be clean and harmless.

Suggestion has been made at different times that the location of a disposal station be at the mouth of Green's Creek, east of Ottawa, connected with the city sewer system by an intercepting sewer along the Ottawa River. Generally speaking, this location is in conformity with the general layout of the system of the larger part of the city. As far as this report is concerned, this location is an admirable one, and is concurred in. Before final settlement, however, the matter will, no doubt, be given very careful study by the

civic authorities. Sewage disposal by scientific treatment is a development of comparatively recent years, and it may be found that instead of one central disposal station as suggested, at the mouth of Green's Creek, it may be wiser to develop the system along the lines of isolated units. With this question also is bound up the life of the present system, and the probable time at which some new system will be essential.

Incinerator Plant

Within comparatively recent years, the development of more sanitary and healthful methods of disposing of refuse and garbage has led to the establishment in cities of incinerator plants. In many cities, for instance, Cleveland, Columbus, Toledo and St. Louis, it is becoming the practice for the city to acquire large capacity cars, and to operate these cars over the street car lines and over the railway lines, out to some central plant. It is found that this is the economical way of handling this material.

Ottawa, at present, has a plant located at the east of the city near the intersection of the railway lines with the Rideau River. The question of its removal to some other place is under consideration by the city officials, and suggestions have been made for its location to the west of the city near Mechanicsville.

As the prevailing winds in Ottawa are from the west and northwest, it is recommended that the plant be placed to the east of the city, in the industrial zone and adjacent to the railway. If the method of collecting garbage, similar to that in use by the cities mentioned, be adopted, and large cars be procured, the cost of hauling it on the railways a mile or two further out is of little consequence. It is thought, therefore, that this plant should be several miles outside the city.

As far as Hull is concerned, later study will have to determine whether a separate incinerator plant is required. If this should be found to be the case, it is recommended that it be placed well to the east of the city in the industrial district suggested.

Stockyards

The location of the stockyards, abattoirs and packing houses in the city, whether large or small, must not, under any circumstances, be placed in the direction of the prevailing summer winds. They should be located at some distance outside the city, adjacent to railway tracks.

As with the incinerator plant, so with this utility, the best location would be to the east of the city. While modern development of this industry is in the nature of large central packing plants at large railway centres, and it is a question whether one of any great size will ever wish to locate in or near Ottawa or Hull, it is nevertheless desirable that the city be protected

in this respect. The experience of other cities, in having an industry of this character growing up within its limits, only emphasizes the desirability of removing it far beyond any future outskirts.

Overhead Wiring and Underground Conduit

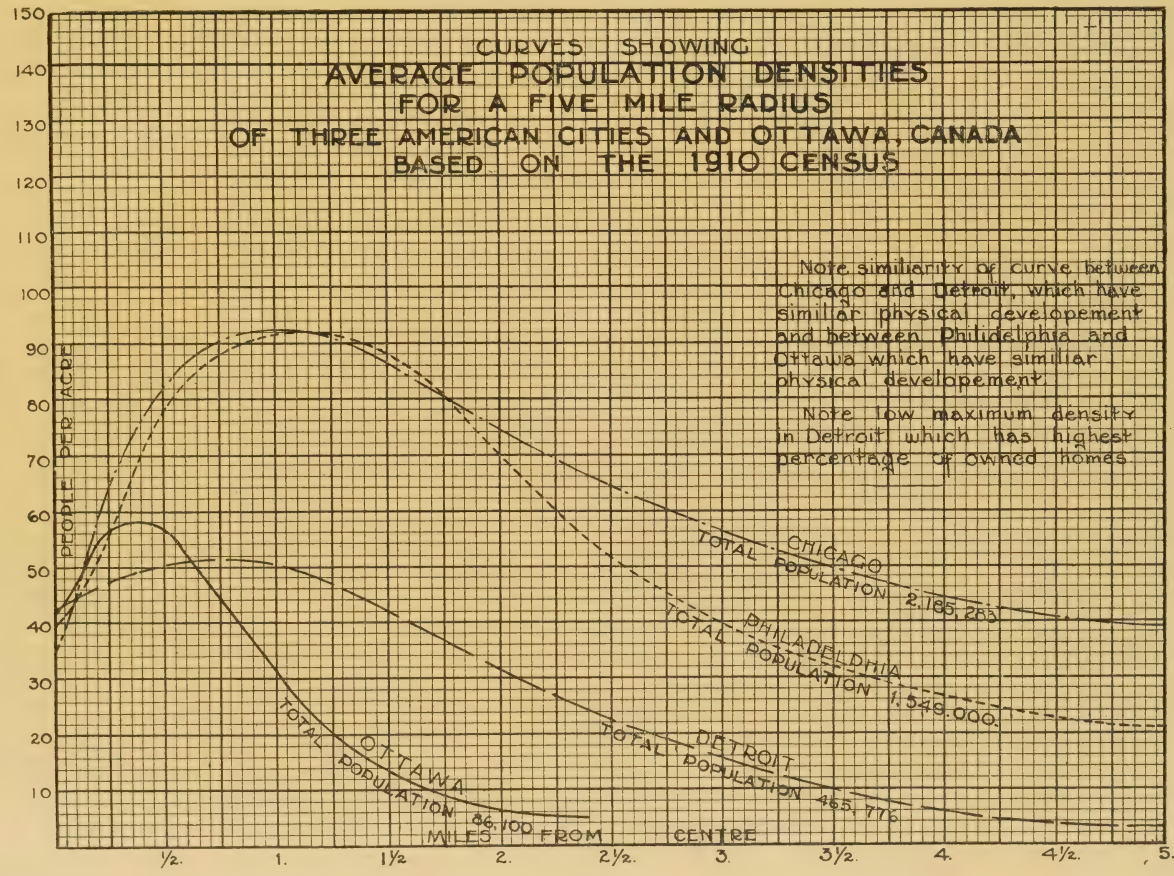
A policy should be adopted immediately by the city, looking to the ultimate removal of overhead wiring from the streets, and the placing of them in underground galleries or conduits. Telegraph, telephone, lighting, and power transmission wires should be placed underground, in both the central and the residential districts. An outstanding example in relation to this phase of the question is the case of the present cluster lights on Sparks Street, where the overhead wire connections to each lamp detract from the ornamental effect these lights give to the street. Wires in conduits under the sidewalk or pavement, preferably the former on account of cheaper cost, would have eliminated this objectionable feature.

The only exception to be made is in the case of the street car trolley wires, which, without very greatly increased cost, cannot be done away with, and it is recommended where subway construction is not provided for, that these be placed on centre poles between the tracks, the street car transmission wires being placed under the street.

It should be the endeavour of the city authorities and of the public utility companies of the city, and also of private companies owning power transmission lines, to arrange among themselves a comprehensive plan for underground conduits. This plan should be made immediately, and carried out as the opportunity arises. Sufficient galleries or duct space should be provided to care for the increase in the future. The execution of this plan should be coincident with street improvements, with water and sewer improvements when made, and with the paving and repaving of the streets. If this procedure be followed, less interference will be caused with the ordinary street traffic during the period of construction, the pavement itself will always be in better condition and the life of the pavement will be prolonged, and the cost of replacing the many cuts will be done away with.

Water Supply

The question of the supply of water is one which we understand has been given study by the civic authorities, and at the present time is under careful consideration. The commissioners feel that, in view of this situation, it is hardly within the scope of their investigation to go into the matter at this time, other than to suggest that in any scheme of development for the supply of water which may be decided upon, all towns and municipalities within the limits of the district be supplied from a common source, adequate for the purpose.

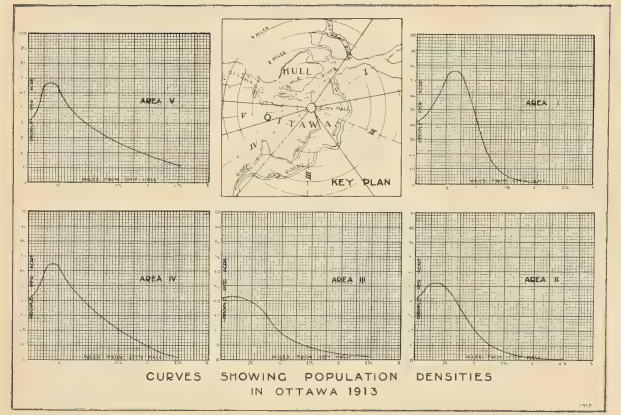

CURVES SHOWING
AVERAGE POPULATION DENSITIES
FOR A FIVE MILE RADIUS
OF THREE AMERICAN CITIES AND OTTAWA, CANADA
BASED ON THE 1910 CENSUS
Note similiarity of curve between Chicago and Detroit, which have similiar physical developement and between Philidelphia and Ottawa which have similiar physical developement.
Note low maximum density in Detroit which has highest percentage of owned homes
PEOPLE PER ACRE
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
TOTAL POPULATION CHICAGO 2,185,283
TOTAL POPULATION PHILADELPHIA 1,549,000.
TOTAL POPULATION DETROIT 465,776
TOTAL POPULATION OTTAWA 86,100
MILES FROM CENTRE
½. 1. 1½ 2. 2½. 3. 3½. 4. 4½. 5.
1915.

DRAWING No. 23

Curves showing Population Densities in Ottawa, 1913

DRAWING No. 23

Curves showing Population Densities in Ottawa, 1913



DRAWING No. 24

Diagrams showing daily volume and distribution of
Passenger Traffic and Street Cars.

DRAWING No. 24

Diagrams showing daily volume and distribution of Passenger Traffic and Street Cars.

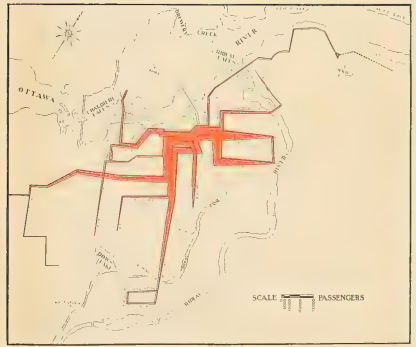


Diagram showing daily volume and distribution of Passenger Traffic.

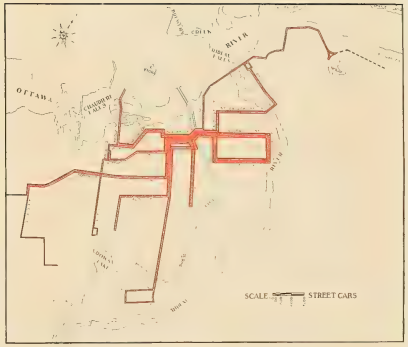


Diagram showing daily volume and distribution of Street Cars.

E.H. BENNETT CONSULTANT ON CITY PLAN
L.L. COSINS CONSULTING ENGINEER
JANUARY 1915

DRAWING No. 25

1. Curve showing Growth of Street Car Business in relation to population.

2. Curve showing Increase in Annual Rides per Capita in relation to population.

3. Curve showing Number of People for each Daily Ride in relation to population.

4. Chart showing Relation of Passengers at Different Hours to Seats Provided over whole system.

DRAWING No. 25

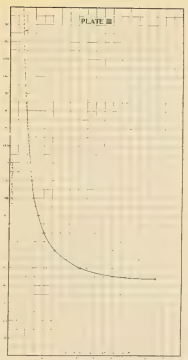
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CVRVE SHOWING GROWTH OF STREET CAR BVSINESS
IN RELATION TO POPVLATION



CVRVE SHOWING INCREASE IN ANNVAL RIDES PER CAPITA
IN RELATION TO POPVLATION



CVRVE SHOWING NVMBER OF PEOPLE FOR EACH DAILY RIDE
IN RELATION TO POPVLATION



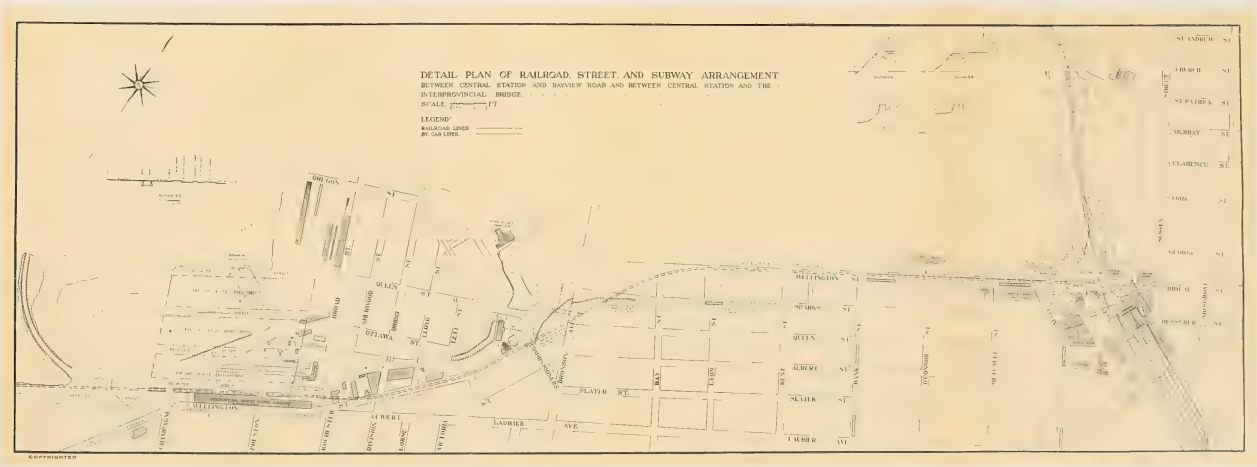
CHART SHOWING RELATION OF PASSENGERS AT DIFFERENT HOVRS TO SEATS PROVIDED
OVER WHOLE SYSTEM

DRAWING No. 26.

Detail Plan of Railroad, Street, and Subway Arrangement between Central Station and Bayview Road and between Central Station and the Interprovincial Bridge.

DRAWING No. 26.

Detail Plan of Railroad, Street, and Subway Arrangement between Central Station and Bayview Road and between Central Station and the Interprovincial Bridge.



DRAWING No. 27.

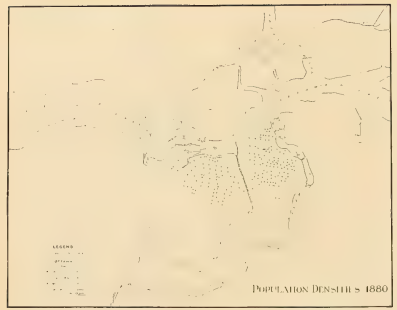
Diagram showing distribution of population in the cities for the years 1880, 1890, 1900, 1910 and 1913.

Each dot represents 100 people.

DRAWING No. 27.

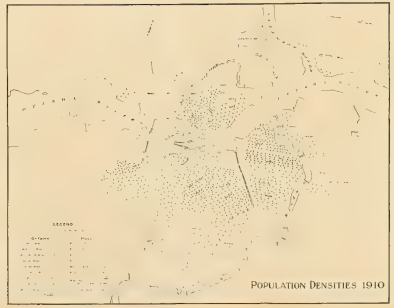
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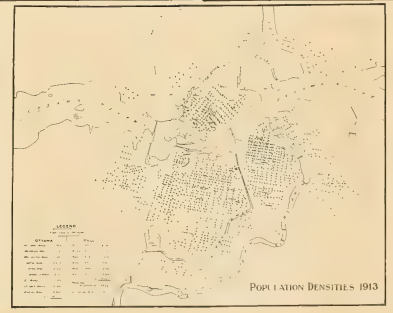
Each dot represents 100 people.











SCALE FT

E. H. BENNETT, CONSULTANT ON CITY PLAN
E. L. COUSINS, CONSULTING ENGINEER
JANUARY, 1915.

DRAWING No. 28

1. Diagram showing Industrial Workers in Canada, Ontario, and five Eastern Cities at different dates.

2. Curve showing Growth of Population in Cities of Canada.

3. Diagram showing Relative Population and Industrial Workers of five Eastern Cities at different dates.

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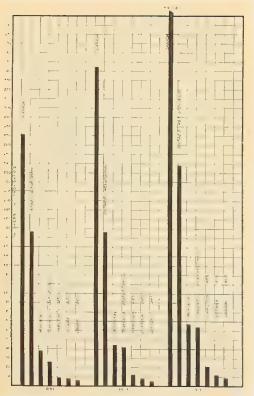
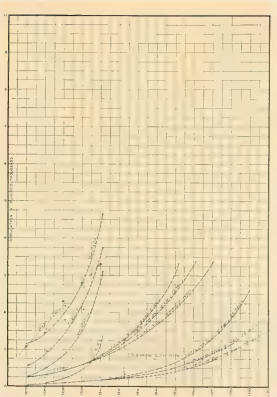


DIAGRAM SHOWING INDUSTRIAL WORKERS. . . . . IN CANADA, ONTARIO AND FIVE EASTERN CITIES AT DIFFERENT DATES. . . . . .



CURVE SHOWING GROWTH OF POPULATION. . . . . IN CITIES OF CANADA. . . . . .



DIAGRAM SHOWING RELATIVE POPULATION AND INDUSTRIAL WORKERS. . . . . OF FIVE EASTERN CITIES AT DIFFERENT DATES.

CONTROL OF RIDEAU RIVER

A report was made on this subject by Mr. Andrew Bell, C.E., in 1901. This appears to be the latest and most complete report which has been made, on the conditions creating the overflow from the Rideau River and the flooding of contiguous property.

The area flooded by the Rideau River is situated for the most part on the east and south bank of the river. It extends all the way from Minto Bridge, through Eastview, to Bronson Avenue. Between the Minto Bridge and Hurdman's Bridge, the flooding is almost altogether on the east bank of the river. From Hurdman's Bridge to Bronson Avenue, it extends along both sides of the river. The total area flooded according to the elevations is about 1,050 acres.

Mr. Bell puts the overflow down to two causes:

(1) The quicker approach of the water during later years from the upper reaches of the river, due to the cutting of the timber and draining of the country for agricultural purposes.

(2) To the ice jams which form in the stretch of the river through the city, owing to imperfect channel bed and obstructions therein.

Generally speaking, these obstructions and lack of channelling are caused by shoals in the river bed, by the leaving in the river of débris of old bridge construction and of the construction of an earth embankment by the Canadian Pacific Railway. These shoals and obstructions extend all the way from above Billings' Bridge to Edwards' Mill.

The old wooden bridges, some of which have been rebuilt since Mr. Bell's report was made, being of short spans and having large piers, also offer obstructions.

Mr. Bell states that if these obstructions and shoals could be removed, the capacity of the river channel would be increased one-third. He suggested the removal from the river channel of all the old wooden piers and loose stone, the removal from the river bed of boulders and the dredging of channels through the shoals, the raising of the Minto Bridge, the opening of the channel through the embankment of the Canadian Pacific bridge near the Sussex Street yard, and widening of the channel past Maple Island.

Mr. Bell studied a suggested overflow outlet through McKay's Lake to the Ottawa River, but found the cost of this to be excessive. He studied also the route of a channel from the Hogsback to the west of the city for overflow purposes, and found that there also the cost would be excessive.

He found that the cost of cleaning and dredging the bed of the river and the removing of obstructions would be about $74,000, not including the cost of any new bridges. He found that the cost of McKay's Lake overflow channel would be about $160,000 or $200,000.

Since Mr. Bell's report was made, some of the bridges have been rebuilt, and improvements carried out. There is still considerable overflow in the spring from the Rideau River, and it is recommended that the remainder of the suggestions made by Mr. Bell be followed, even in the event that at a later date it may be found necessary to construct an overflow channel. The material taken from the river could be used as he suggested, for the filling of the extremely low land.

Mr. Bell's conclusions and recommendations from study given this subject appear to be most reasonable, and a continuation of the policy set forth in his report is recommended.

DRAWING No. 29

Plan of Ottawa, Hull and Vicinity

1914


OTTAWA RIVER
CITY OF HULL
OTTAWA RIVER
CHAUDIERE FALLS
VICTORIA ISLAND
PLAN OF
OTTAWA. HULL AND VICINITY.
1914

